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# THE AMERICAN GAS LIGHT JOURNAL

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[OFFICIAL NOTICE.]

### Fifteenth Annual Meeting, Ohio Gas Light Association.

OFFICE OF THE SECRETARY, DELAWARE, O., Feb. 16, 1899.

To the Members of the Ohio Gas Light Association: The 15th annual meeting of the Ohio Gas Light Association will be held at Springfield, O., March 15 and 16, 1899.

Owing to the death of our President, the late Mr. B. P. Holmes, of Youngstown, O., the meeting will be called to order by the Vice-President—Mr. E. H. Jenkins, of Buffalo, N. Y.—at 10 A.M., Wednesday, March 15, in the Arcade Hotel, the headquarters. An address of welcome will be delivered by the Governor of Ohio, General Asa S. Bushnell, President of the Springfield Gas Company. The following papers are promised:

"Distribution Records: Their Uses and Preservation," by Mr. J. A. Mayer, Supt. of Streets, Detroit (Mich.) City Gas Company.

"Welsbach Street Lighting," by Mr. J. W. R. Cline, Secretary and Manager, Springfield (O.) Gas Company.

"A Bunch of Short Topics," by Mr. Henry L. Doherty, General Manager, Madison (Wis.) Gas and Electric Company.

"Some Notes on the Construction of a Concrete Gasholder Tank," by Mr. C. W. Andrews, President Hamilton (O.) Gas Light and Coke Company.

"By-Product Coke Ovens," by Mr. E. E. Eysenbach, Supt. of Works, Columbus (O.) Gas Company.

The executive session will be unusually interesting, and some "Notes" on a subject of vital importance to the profession will be presented. The Question Box will be given special consideration, and each member is requested to make contributions for it.

An opportunity will be given any of the speakers at the meeting to correct their remarks before leaving Springfield; but not after, as all the reports will be turned over to the printers immediately after the adjournment of the meeting.

The management of the Arcade have named the following very low rates for the meeting: $2, $2.50, and $3 per day, American plan. The most satisfactory quarters are always obtained by writing in advance to the hotel people.

Application blanks for membership, and any further information which may be desired relative to the meeting, will be furnished with pleasure by the Secretary. T. C. JONES, Secretary.

[OFFICIAL NOTICE.]

### First Annual Meeting, The Kansas Gas, Water and Electric Light Association.

OFFICE OF THE SECRETARY,
LEAVENWORTH, KAS., Feb. 18, 1899.

To the Members of the Kansas Gas, Water and Electric Light Association: The Executive Committee of the Association have decided to postpone the first annual meeting (originally named to have been held in Topeka, Kas., the 15th and 16th inst.) to the 15th and 16th days of March; the sessions to be held in Topeka. The postponement was ordered because of the expressed inability of many of the members to be present at the initial time set, through the prevalence in this section of extraordinary low weather temperatures.

Yours truly, J H. FOLEY, Secretary.

[OFFICIAL NOTICE.]

### Wrinkle Department, Western Gas Association.

WESTERN GAS ASSOCIATION, OFFICE OF THE SECRETARY,
NEW ALBANY, IND., Jan. 16, 1899.

To the Members of the Western Gas Association:

Mr. E. H. Jenkins, Editor of the Wrinkle Department, desires it known that those who have contributions to offer for publication in this valuable division of the Association's proceedings, should forward the same at as early a date as possible. All matter of this nature should be in hand not later than April 1st. Let no member fail to mail Mr. Jenkins a description of any device that saves labor or insures through its use better service in the production or distribution of gas.

Address all communications to Mr. E. H. Jenkins, Engineer Buffalo City Gas Company, Buffalo, N. Y. J. W. DUNBAR, Secretary.

## BRIEFLY TOLD.

OBITUARY NOTE, MR. CHARLES R. FABEN, SR.—Last week we reported the death of Mr. Charles R. Faben, Sr., which event occurred at an early hour of the morning of February 22d, in his home, 224 Sixteenth street, Toledo, Ohio. In 1896 Mr. Faben was prostrated by an apoplectic attack, from which he never fully recovered, although his sturdiness, despite his advanced years, was such that his days, between the first inroad of disease and its finality, were passed in mental strength and fair physical comfort. Deceased, who was born in Plymouth, England, August 8, 1824, was the son of an English naval officer, and the son elected to follow the father's calling. In this pursuit, as in about all else that he undertook, he was successful, holding, as he did at the time of his resignation from the British service, the post of

master's mate. His resignation was tendered in 1851, and shortly thereafter he came to the United States, settling in New York city, with the purpose of accepting a responsible position with the Manhattan Gas Light Company. This purpose was carried out, and he remained with the Company until 1860, when he undertook the task of constructing the Fairhaven (Conn.) gas works, which plant was eventually absorbed and operated by the New Haven (Conn.) Gas Light Company. During this time he also had much to do with the operating of the works of the Meriden (Conn.) Gas Light Company. In 1866 he accepted the place of Superintendent to the Toledo (Ohio) Gas Light and Coke Company, which concern he served with signal ability for some years, resigning therefrom to assume charge of the works' division of the Milwaukee (Wis.) Gas Company. This active duty he faithfully carried on until 1885, in which year he retired from active business life, to enjoy that repose consequent upon faithful work and its rewards. He selected Toledo as his resting place, and of its citizens he was a valued member. His wife, to whom he was married in 1847, survives him, as do seven children—three daughters and four sons. Of the latter, two are well known in the gas industry—Charles R., Jr., General Manager of the Toledo Gas Light and Coke Company; and Walter, Manager of the Defiance (Ohio) Light and Railway Company. The funeral services were held in Trinity Church, Toledo, the afternoon of the 24th ult., the Reverend Edward S. Barkdull officiating. The services at the grave (the interment was made in Woodlawn Cemetery) were conducted by the Toledo Commandery. Deceased was a man who never courted publicity, but who had the happy habit of doing the right thing at the right time, and whose enduring monument is the respect and affection of those whose ways in life led them in contact with him.

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OBITUARY NOTE.—MR. CHARLES F. WARREN.—At the last meeting of the New England Association of Gas Engineers, President Fowler called attention in his address to the death of Mr. Charles F. Warren, of Manchester, N. H., one of the earliest members of the Association, and the Association, through a committee, subsequently approved a brief minute to his memory. Owing to the long retirement of Mr. Warren from active business it has been a difficult matter to gather the facts connected with his life, and these, so far as we have been able to collate them, are thus briefly stated. Deceased, who was born in Alstead, N. H., February 13th, 1814, was, at a very early period in his history, obliged to shift for himself. His first experience in trade was in a Dedham (Mass.) shop; his next venture was in a factory in Nashua, N. H., and in 1841 he was in the employ of the Amoskeag Mfg. Company, Manchester, N. H. Ingenuity, skill and perseverance having marked his course, in 1865 he was appointed Superintendent of the old Manchester Gas Light Company's works, which he served with ability and success, until 1883, when he retired on a modest competence. Mr. Warren joined the New England Association of Gas Engineers on the occasion of its second annual meeting, and for many years his was a prominent presence and influence in its always valuable and effective work. In fact, of late years, or since increasing feebleness prevented him from attending its sessions, the Association forwarded by telegram its kindly remembrances. The correspondent who sends us the main facts stated above remarks: "He was always faithful to all interests in his charge and studied to advance the work which he had in hand. He was a most conscientious man and exemplary citizen."

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NOTES.—As will be seen from our advertising columns, Mr. James T. Lynn, formerly of the firm of Baxter & Lynn, has engaged on his own account as gas engineer and contractor. His offices are in the Wayne County Bank Building, Detroit, Mich., and there he will be glad to have any visiting gas man call upon him. He proposes to have his share of consulting and contracting work, and he certainly is qualified by experience to obtain it.——Mr. Charles L. Gerould, who has been the efficient Superintendent of the American Gas Company's plant at Mount Vernon, N. Y., for nearly, if not quite five years, has accepted the position of General Manager of the Galesburg (Ills.) Gas Company. The syndicate (it is controlled by Portland, Me., capitalists) which owns the Galesburg works also owns the plants at Michigan City, Ind., and Geneva, N. Y., and these will also be directed in a consulting capacity by Mr. Gerould. We are sorry he leaves New York, but wish him the best of good luck, just the same.——The United Gas Improvement Company has been awarded a contract by the Lowell (Mass.) Gas Light Company for a set of standard double-superheater Lowe water gas apparatus, up to a daily capacity of 1,000,000 cubic feet. This will be the second installation of water gas apparatus in the Lowell Company's works, and it is excellent testimony to the fact that the Company's business is rapidly expanding.

[OFFICIAL REPORT—REVISED BY THE SECRETARY.—Continued from Page 297.]

## PROCEEDINGS, TWENTY-NINTH ANNUAL MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

HELD IN YOUNG'S HOTEL, BOSTON, MASS., FEB. 16 AND 17, 1899.

### FIRST DAY—FEB. 16—MORNING SESSION.

*Discussion on the paper[1] by Mr. J. J. Humphreys, on Notes on the Design and Extension of a Gas Plant.*

The President—Many points in this instructive paper it seems to me must interest us all, and so lead some of you to tell to us the results of your experience. Regarding the situation of gas works as to transportation facilities few of the members of this Association have had the oppportunity for choosing, for most of us found our works in a certain position and have had to do the best we could under the circumstances. They are, however, ordinarily fairly well selected, and at the time the sites were selected they were probably the best positions available. Although Mr. Shelton's works are not yet started, I understood from him they were very well located. Perhaps he would tell us about that, and whether there may be something even better than a gravelly knoll on which to put a holder.

Mr. Shelton—Mr. President, I have nothing especial to say on the matter, but I will do my share towards keeping things moving. As far as our railroad facilities went we had no particular question up, excepting to get the railroad to put in a switch for nothing. We did not succeed either, not having competition at that particular point! I cannot say that I know of any particular experience that I have had that relates to the transportation of material for gas works. It is almost self-evident on its face that one must locate as advantageously as one can, of course in due balance with the other factors that go to make up the whole. Two points, however, occurred to me in connection with Mr. Humphreys' paper, upon which I would like to ask for information. He refers to the coating of the inside of purifying boxes with cement for purpose of preventing corrosion. That, I imagine, is more or less a theory rather than a result of any actual extensive corrosion that has been experienced in the use of oxide on the interior of boxes. I would like to ask for my own information if any member has had any extensive, serious corrosion or eating of his boxes—the cast iron part or structural part—not the light bars or wrought iron supports, but the boxes themselves—from the use of oxide. I have not learned that such is a trouble in using oxide, and would like to know if I am mistaken on that point. Mr. Humphreys also speaks of building a holder with the expectation of adding the second and third lift in the future, putting on the portion of the cup that might ultimately be necessary and arranging everything by having that cup, and then adding the second lift without throwing the holder out of use. My experience with holder gangs is such that in my opinion they would radically object to working on a floating foundation or base. I cannot see how they could satisfactorily construct the side sheets, having to work on the inside, as they must to a greater or less extent, with the inner original section floating. It goes up and down; it is not stationary, being in active use. It may be only that my experience has not happened to run across such a case, but I would like to ask if some one can refer me to a specific instance where a gas company having only one single holder has added a second lift to it without throwing that holder out of use.

Mr. J. J. Humphreys—I must admit that I do not know of a case where it has been done; but I do know that it can be done. By operating the works carefully the holder can be kept pretty low, and the sheets, as they are put together, strung from the guide frame instead of from the curb of the tank. As to the corrosion of the purifiers, ordinarily they do not corrode enough to count. At the works where I now am, while the boxes are coated partly on the sides and entirely on the bottom, the grid carriers, which, to be sure, are only ½ inch cast ribs, have rusted practically away. That is to say, there is a difference in oxide. We use considerable sal-ammoniac in our oxide, and it is very much more alkaline than most oxides.

Mr. Shelton—It would seem to me, at least I should fear, that the holder contractor would charge 20 per cent. more in his price for being subject to interruption and possible delay, because of the necessities of the gas company perhaps compelling the use of the old holder, and his temporary suspension of work. It seems to me it would be a most

1. For the text of this paper, see JOURNAL, Feb. 27, p. 295.

difficult matter to get a holder contractor to confine himself to his original bid if he found later that he had to add the second section under such conditions. It does not seem to me within the range of ordinary probabilities. It would seem to me that the gas company could better pay a couple of thousand dollars more and put up a small holder, which they could afterwards use as a relief holder perhaps, and make gas from it temporarily and throw the main holder entirely out of use and thus be able to get the best price possible from the contractor. In commenting upon those two points I do not wish to be understood as criticising Mr. Humphreys' paper. I think, on the contrary, it has a very great number of good points, major and minor. One which I should especially call attention to is the corrosion of the inside of box lattice holder columns. I think that is a very good reminder, and that those who have charge of holders having columns of that nature (in the multiplicity of other things to attend to) are quite apt to forget that the interior of those wrought iron columns, exposed to the air and the elements, should be examined more frequently than they probably are.

Mr. Gifford—In connection with the inner lift of the holder, I would like to ask if any one here has ever built a holder in that way. In discussing the building of a new holder recently estimates were called for both ways—building the inner lift only and building the holder complete—and the judgment was to build the holder complete.

Mr. W. A. Learned—Speaking from memory, I think at Waltham they have quite a large holder in which the inner lift was built originally with the intention at some future time of putting in the lower lift. They had two holders, however.

Mr. Coffin—At Malden some years ago a holder was wrecked by the wind. They put in the inner section and used it the balance of that winter, and the next summer they pumped out the tank, having other holders, and put on the outer lift.

Mr. McKay—I think the reference in Mr. Humphreys' paper to the consideration of prevailing wind is occasionally overlooked and has a bearing not only on the production of the retorts and on the production of the water gas apparatus, but also on the handling of the raw materials, as to varying weather conditions. The item referring to the use of blowers I presume refers to water gas apparatus. I hope he will tell us, during the time that the apparatus was running, what per cent. of the time per hour the apparatus was on blast, what per cent. of the time it was making gas; also, what pressure it carries on the inlet of the generator. If there is any novelty in this method of using oil in the retorts I hope Mr. Humphreys will tell us what it is. With respect to the purifying house, mention is made of shutting off houses by a blank wall. I think it is essential that the purifying house and the curing house, where oxide is used, should be very full of light, having regard to heating also, and that some consideration should be given to using the sunlight whenever it can be used in the purifying house. This has a very essential effect in reviving the oxide.

Mr. J. J. Humphreys—As to blower and blower pressure, to illustrate my own case, although I did not intend to speak of our working, we had a set with about 18 inches pressure, and a run at that time gave us a daily make of about 550,000, with, say, 600,000 the maximum. By putting in a blower that was strong enough to speed without bursting, we ran about 27 inches, and succeeded in getting about 900,000 as a maximum with the same set. Incidentally we reduced the resistance in set. The proportion of the hour that would be gained is not so very great, but it amounts to something. The principal management was in getting more air. We averaged perhaps 1¼ minutes off each blow, which would give us almost one extra run per hour. As to the method of introducing the oil, it is the simple one of putting it in which Mr. Fowler and many others use—throwing an oil cartridge in on top of the charge at the last moment. I think perhaps that even could be bettered if the oil were introduced not all at once, but spread over a long period of time. With steam we made from each mouthpiece about 10,200. Without steam we could get out 10,800 or 11,000. On a day after it had been shut down, Sunday night, for instance, we sometimes got 12,000 feet. That was unavoidable without banking of fires.

Mr. Addicks—I would like to ask Mr. Humphreys as to the results in regard to cooling the condenser, driving rotary blower.

Mr. J. J. Humphreys—The condensers are still large enough for a natural draft. We run one on water and one on air. The intention is to use the very low pressure ventilating fan (when we need more capacity) which is very economical of power, giving the widest possible opening and reducing the back pressure to the minimum. Each condenser has 400 3-inch tubes. We can get considerable air through that even with the air heated.

Mr. Addicks—I was particularly interested, because for the past 6 or 8 years the cylindrial condenser that I have built is provided with openings at the top and bottom for the circulation of air or a blower, with the idea of saving water. We have never had that in service, because Mr. McKay, by a very ingenious method, has so reduced the water bill, actually cut it in half, amounting to $5,000 a year, that we have had no occasion to worry about the condensation thus far.

The President—I would state here I believe that thing is perfectly capable of mathematical demonstration. You simply have to know how many cubic feet of air will be required to take up the heat there is in the gas and put an air current through the condenser, according to the temperature of the air and the temperature desired in the gas. I can't myself now state what the rule is, but I have seen it applied in my own case, where I am working a condenser with natural draft, and I did it because of the mathematical demonstration to me that it would take care of the gas. Has any other gentleman anything to offer?

Mr. J. J. Humphreys—In connection with these cooling condensers on water gas, if a man cares to run a slight danger or risk he can suck the air that goes to his generators through his water gas condensers first, and then put it into the generator. He will gain a slight efficiency in heating his air also; but then there is, of course, always a liability of a leak large enough, during the period of slow running of the blower, to make a dangerous mixture. Also, you perhaps will have a slight vacuum on the inlet to the blower.

Mr. Addicks—If the blower is sucking the air through the tubes you would have a vacuum round the tubes, but if on the other hand you were able to blow the air in through the condensers and keep the pressure the same on both sides, or a little extra possibly on the air side of the condensers, there might be very little danger with it. I should be glad if the gentleman tries it if he will let me know how it works.

Mr. McKay—I hope Mr. Humphreys will tell us what temperature he wants to attain at the inlet of the purifier.

Mr. J. J. Humphreys—We are rather queerly situated. We get sometimes a little more condensation than we really want. Of course, we try to have our temperature about 70°; probably it would be better if we had it higher; but as a fact it gets down to about 55° in the purifiers during such weather as we recently had. Perhaps if I had the choice I would put the temperature up pretty high, say 80°. The water gas condensers are run so that the temperature at condenser outlet is 80°. Leaving the pipe, which is rather a long one, between the condensers and the relief holder, we expect the gas to be at about atmospheric temperature. Then the cold water gas, meeting the coal gas just before the exhauster, serves to aid in condensing the latter. The coal gas reaches our exhausters usually at about 138°, and we bring it down to about 100°, according to, of course, our rate of mixing, which is without any condensing at all, simply by mixing in the cold water gas.

Mr. Hayward—Mr. President, I think Mr. Humphreys deserves a double vote of thanks for this valuable paper, not only for writing it but for having it printed. I would recommend that all here put a copy of it in their left side pocket next their heart, refer to it frequently, using their pencils to underscore some of these things. Many items in it especially interested me as a purveyor of purifying material, because I—well, I would not dare tell you the amount of express charges I have paid for samples of spent oxide that came back to me coated with tar, and with an expression of wonderment as to why it did not purify more gas. On the bottom of the 4th page are these words: "Lack of condenser capacity in a generator room is a common fault." That is one of the things we encounter so many times in gas works. Iron, as you all know, naturally is cold, and when the warm gas strikes it trouble ensues right away, in the form of naphthaline and other condensation. Again, he refers to the fact that the purifying houses are not kept sufficiently warm. That is another trouble. Again, he says on the 5th page, towards the bottom. "The purifiers should be very large, as the efficiency per bushel of oxide between changes is greatly affected by the rate of flow." Then he quotes the figures, in summer time reaching 33,000 between changes, and in the winter time running down to 10,000, which is simply due to the rate of flow. The boxes are not large enough, and it is the one thing that we have to contend with continually in using iron purification. Another thing that I would call your attention to is the mechanical handling of purifying material as a necessity. Only to the large companies is there economy in this because the interest on the investment will hardly pay small ones, when it is so easily handled now by having spouts from the boxes down to the lower cellar. And, then, the last (but not least) paragraph of all—I don't know why he did not put it in capital letters; I would, if I had written

it: "The great majority of companies are benefited by the use of an automatic gas pressure governor." (Laughter.)

Mr. J. J. Humphreys—Of course, I did not care to mention any governor. We use the governor with a float loaded according to the length of stroke, which, of course, is one of the most popular here in America.

The President announced that the recess hour was at hand. Mr. Nettleton moved a vote of thanks to Mr. Humphreys, which was adopted. Mr. Nettleton also suggested that, as there were various things connected with purification touched upon in the paper, which matters had not been thoroughly ventilated so far in the discussion, the discussion be resumed after luncheon.

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FIRST DAY—AFTERNOON SESSION.

The President—As there are so few present it seems a pity to carry on the continued discussion of Mr. J. J. Humphreys' paper, which can come up later when the attendance is larger. Meanwhile, if no objection is offered, I will read (inasmuch as Secretary Prichard is not in good voice) the following paper, by Mr. Alexander C. Humphreys, on the subject of

## CORRESPONDENCE SCHOOLS.

At the eleventh hour I have been over persuaded by your officers to prepare a paper for this meeting.

At the present time the demands upon my time are so many and so important that I felt I could not in justice to myself undertake to write a paper requiring any long continued effort, but I felt that if I could settle upon a subject upon which I could write readily, and which, in spite of such lack of preparation, would be of interest to you, I ought to undertake the task; for I appreciate that, so far, I have not done my share of work as a member of this Association.

There is a subject very near to my heart, and which is receiving so much of my attention at the present time as I am able to give to it. I refer to the educational work of the American Gas Light Association. This work naturally suggests the general subject of correspondence schooling. On this subject I have more or less general information; and, therefore, I finally decided to present the subject to you without further preparation.

Let me, first, briefly outline the work of the American Association's educational scheme. While many of you are quite familiar with the facts, I am sure there are many who are not. To this opinion I am led by my contact with members of the profession throughout the country. Even members of the American Association I find often have but the most incomplete information of what we have been aiming at and *what has been actually accomplished.* Recently the subject was up for informal discussion before one of the other local Societies, and I was astonished to find that apparently a majority of the members were unaware that any real progress had yet been made by the Committee first having the matter to charge.

In 1895 the American Association authorized a special committee to undertake in its name the work of helping the young men connected with our business to a more thorough education through correspondence methods. The work was pushed ahead successfully, and we of the committee were agreeably surprised at the numbers applying for membership, the large percentage of those who stuck to their work, and the progress evidenced by the character of the papers and answers finally sent in. But in spite of the success of our efforts, a change was rendered necessary. Mr. Walton Clark, upon whom had fallen the major part of the labor, was forced, through lack of time, to give it up. We then decided to try to raise a fund sufficiently large to pay for the services of a thoroughly competent man to act as instructor and to cover the other incidental expenses. We felt that we must in advance obtain pledges for five years' subscriptions at least. We were successful in our efforts, and while we could well use more money if we had it, we can make a good start with the money so far pledged. Further efforts will be made to increase the fund so as to avoid the possibility, and even probability, of our having to reject applications for membership, which even now threaten to run us beyond our present means.

The fund raised and the educational work in general have been placed absolutely in the hands of a Board of Trustees, three of whom have been elected by the American Association, and the other two are the President and the junior, past-President of that Association.

The by-laws adopted by this Board will soon be published in the gas JOURNALS, and I, therefore, will not refer to them at this time.

The Trustees have organized, by the election of Mr. Walton Clark as Chairman, Mr. Eugene Vanderpool as Treasurer, and Mr. Alfred E. Forstall, Secretary of the American Association, as Secretary of the Board of Trustees. Mr. Forstall will be the working officer, and he will devote so much of his time to this educational work as may be necessary to completely carry out the views of the Trustees.

The Trustees have taken offices in New York City, at the corner of Pine and William streets, and here also will be set aside one room as a headquarters of the American Association, where its visiting members will always find a welcome.

Let me now briefly outline the rules under which this educational work will be carried on.

Our procedure will be as simple as possible. To secure admission to the class, it is only necessary for the applicant to fill out, and have properly endorsed, by either a member of the American Gas Light Association or a subscriber to the fund, an application giving his full name, age, length of time devoted to school attendance and character of schools—that is, whether primary, grammar, high, or college; and also, nature of employment at present time and the positions held previously. Continued membership depends upon the students' own efforts; the single condition being that answers to the questions sent out be returned promptly to the Secretary. Any student not answering, *or not explaining his failure to answer*, any set of questions forfeits his membership.

There are no examinations, and for the members entering the class this year some of the old questions will be repeated, it being assumed that, as a desire to learn is the only incentive to join the class, this desire will prevent the mere copying of answers previously given.

It is the intention for the present to continue the present plan of sending out 4 lists of about 12 questions each during this year. Answers to each list must be sent in before a certain specified date. Those of each student are carefully looked over, good work and errors noted, and a personal letter sent to the student praising the good points, pointing out the weak places and giving suggestions as to the best manner of correcting the faults indicated. Advice will also be given as to the text books, etc, and it is expected that students will write to the Secretary explaining difficulties as encountered, so that direct aid can be given. When this is not done, the student's record, as given on his application and his answers to the questions, will be used as a basis for judging of his needs in the way of advice. This personal contact between students and instructor, even though it be only by correspondence, should be a great factor in the benefit to be derived by membership in the class.

At present there are two classes; the advanced, which has had the benefit of three years' study, and the new class now taking up the work for the first time with the questions about to be mailed to them.

As yet the question of length of course has not been determined. It will depend somewhat upon the results of experiment as to how many different classes and how many students can be properly taken care of with the facilities and means at the disposal of the Trustees.

The main idea is to give the man that wishes to learn an opportunity to have direction given to his efforts. The work can be successful only with those who are in earnest, though faltering purposes may be strengthened by the influence of the class. But it is not the intention to attempt to convert lazy, careless men into industrious students, the fundamental motive being rather to assist those who are already endeavoring, even though feebly, to secure the knowledge unfortunately not included within the scope of their preparatory education.

You may ask, "Who applies for membership under this system?" The reply is, superintendents, assistant superintendents, secretaries, clerks, clerks of works, workmen, apprentices, and even educated engineers recently joined to our ranks, who wish, as quickly as possible, to make their technical education available in the business of their choice.

It has been astonishing to all of us to find the variety covered by our roll of membership. It is at once to be borne in mind that it is our aim to make the course as *practical* as possible; or, perhaps better say, to combine as completely as possible theory with practice.

The line along which the work proceeds admits to an unusual degree of this harmony of theory and practice. We are teaching men whose daily life shows them the need of further mental equipment. We are not teaching something about which the student may be led to enquire, "What is the use of this?" "Shall I ever have use for this?"

The theory and the practice go hand in hand, and here is an element of strength which all will do well to appreciate. It is a feature which is being most carefully developed by our regular institutions of learning both here and abroad. Too much importance cannot be attached to this feature, which feature we enjoy to a degree beyond the reach of any regular course of schooling.

It is a great thing to be able to secure a good education as a foundation; but, wanting that, what can be more practical than such an education as we are here trying to impart?

In some cases no doubt the primary education will have to be supplemented before much can be done by our course, but here we will be prepared to point out the way. And how important it is to the ignorant to be told where to go for the information sought? How many there are, anxious to improve themselves, who day by day, and even finally, let the opportunities slide by simply because there is no one to point them out. Many who, once started on the road, would pursue it with the utmost zeal and perseverance, would never know of themselves how to find the opening to the road.

It may be a surprise to some to learn that correspondence schools in general are now doing a very important work. They enjoy the advantage of having a membership composed of men determined to learn. The very fact that they are found engaged in such a course proves as a rule that they are selected men. The students are almost invariably men who are earning their livings, and who must do their studying by working double shifts. But as a rule they enjoy the advantage spoken of—namely, the combination of study with practice.

I recently went through the membership list of a prominent correspondence school which devotes itself chiefly to the teaching of electricity. I was astonished to find on its rolls men in all walks of life, from the workman to the professor, and also to find that the member ship included not only men from all parts of the United States, but from all parts of North and South America, the West Indies, Great Britain, Africa, Asia, Australia, New Zealand—in short, the world. One of these schools has a membership of between 70,000 and 75,000.

Now, as I have said, in the case of some of our students, we shall no doubt find that they are not able to take up our questions to advantage for lack of a common school education. In such cases my advice would be for the student to join one of these regular correspondence schools, and so acquire the necessary equipment in the fundamental studies, especially in mathematics, physics and chemistry.

While it is to be the aim of the Trustees of the Gas Educational Fund to teach our subject in the simplest and most practical way, it will at once be seen that a fair fundamental education will be sooner or later found necessary.

My advice then would be, if the proposed student finds himself handicapped in his work, by lack of previous training, to at once join one of these outside correspondence schools, and then, as he finds himself able, to *in addition* take up the work of our practical class in gas engineering.

That there may be no mistake as to my opinion of the value of this practical course, I will say that I should advise any young man who has graduated from the Massachusetts Institute or from Stevens, or any other scientific school, and who has joined our ranks, to join this practical class and so the more quickly and thoroughly make his technical education available in *this particular line.*

So much to show my estimation of the value of this course. I am forced to add that the Trustees would probably be unable to act favorably upon the application of these educated men, for if the classes fill up as they now promise to, we cannot find room for all, and, therefore, we must give the preference to the men most in need of help. When I state we have now over 100 men enrolled, it will be seen that we must here exercise some caution.

Bearing in mind what I have said about the necessity of being explicit with those looking for guidance, I shall mention three correspondence schools, even at the risk of being misunderstood—one of these I have before mentioned in a paper on a somewhat similar subject before a sister Association:

Correspondence School of Technology, Cuyahoga Building, Cleveland, Ohio.

Electrical Engineer Institute of Correspondence Instruction, 120 Liberty street, New York City.

International Correspondence Schools, Scranton, Pa.

The question of expense should not deter any man from joining one of these schools. Such a preliminary course as I have here referred to as in some cases desirable, in connection with our gas course, would only cost from $25 to $50, complete, including the printed matter required during the course.

Any who may contemplate doing work under the guidance of the Trustees of the Educational Fund should write to Mr. A. E. Forstall, Secretary, No. 58 William street, New York city.

I appreciate that what I here present is sketchy in the extreme. But I shall hope that the subject is of sufficient interest to excite discussion, and if so, the discussion will be of more value than the paper.

I am sure there is not a man in this room who cannot help someone else to the benefits of a higher education, if he will only look around for the opportunity to guide those who are blindly groping for need of such guidance. Surely such a work of love should commend itself to all, and especially to those who have themselves been forced to acquire their education outside of the more ordinary paths and in the face of obstacles more or less disheartening.

I shall be only too glad to try to answer any questions which may be suggested by this hasty and incomplete presentation of a most important subject.

*Discussion.*

The President—Allow me to add, gentlemen, that I am reading this for the author and not expressing my personal views when I say that "I shall be only too glad to try to answer any questions." (Laughter.) Mr. Humphreys expresses the hope that this subject will be of sufficient interest to excite discussion, and if so, the discussion will be of more value than the paper. I should be sorry to learn that he would be entirely disappointed about the discussion, and hope that some of you will say something on the question of correspondence schools.

Mr. J. J. Humphreys—Mr. President, I think we should remember that pride enters very largely into this matter of correspondence schools. A grown man, while he may appreciate that he is very ignorant, is rather ashamed to have anybody else know it, and these correspondence schools fill that niche quite well. They don't advertise the scholars and the scholars learn a great deal on the quiet, without telling their neighbors that they are learning what they did not know before. The class of scholars that this school opened by the American Association meets is, principally, I think, young clerks in the offices or works clerks. I have known a few of them. They don't like to have anybody know they don't know things, but they want to learn, and the school answers very thoroughly for that purpose. You will notice that this school of the American Association does not tell who are in the class. If it did, many scholars I am afraid would leave it for that very reason.

Mr. Nettleton—It seems to me that the matter of how the men who wish to join the class of the American Association shall get a sufficient preliminary education to enable them to go on with the class work is a side detail. What Mr. Humphreys wants to call attention to is the fact of the work that is being accomplished to teach the men, especially the young men in the gas business, and in that way to give them a chance to rise. I heard Mr. Walton Clark, in talking about this work and the time he had given to it say with a good deal of feeling, "I want to give a chance to the young man who has not been able to receive a technical education; I want to give him a chance to get on." That is the feeling which is back of this whole educational movement of the American Gas Light Association. To me it is one of the finest, one of the noblest, works that has ever been undertaken by an Association like ours. It is an effort to do good in a very broad way, and not only a broad way but a lasting way. The dollars that we contribute at the present time will last through years and probably through generations. If one stops to think for a moment, the results seem almost endless. I think there is no money that I have given so cheerfully in years as the contribution that I made to this object, and if you gentlemen who have not had your attention called to it will think of it for a little while, you must come to the conclusion that it is worthy of a hearty support from every gas man in the country.

Mr. Coggeshall—Speaking of the advantages of correspondence schools, in this line I want to refer to the steam engineers. Two years ago I took on a bright young man about 21 years old as a fireman; his brother who started with me as a fireman eventually became an engineer and kept up study in correspondence schools. This young man started in the same line and six months ago he had a license to run a 150-horse power engine. He kept at his studies. Two weeks ago his brother was taken sick (I have three engineers) and two days afterwards my chief engineer had a telegraphic dispatch from Baltimore saying that his son who was dying wanted him to go to him immediately. This left me very short handed. I had only the young man first spoken of, and one of my regular engineers. I sent to the Putnam Machine Company, thinking they could get me a man, but they could not spare me one. I made several applications to other concerns without success. Then I talked with the two left of my staff. They said they were willing to take a run of 12 hours—we run 24 hours. It was with misgivings, but I was obliged to try it. They ran along for a week, and did their work well, and without accident, at the end of which time the regular staff was again in charge. That experience speaks well for the value of correspondence schools.

Mr. Burritt—Let me add a word in regard to what has been said, as

matter of personal experience. I joined the first class. Having been in the electrical business some years, a small gas works was put under my charge, and I was totally unprepared to do justice to it. I availed myself of this class and found it a very great benefit. Some of the questions are simple and others are not so simple, but about all of them are of such a kind that the student cannot get his answer out of the ordinary gas handbooks. I pursued it a year and nine months, I think, when increased business duties forced me to give it up; but during that time it was a matter of very great assistance to me, as I have said, and the personal interest that the Secretary manifested in the work was interesting also. Two or three letters on questions that I asked were promptly answered, and also an encouraging word now and then regarding the work and thanking me for my interest and attention to the class, etc., were things that help a man all round. You know some people say they know a thing, but they cannot express it in words. We know that that is not so, as the only things that cannot be expressed are emotions. If we know two and two are four we can express it in words; if we don't know it we cannot find words to express it. In that same sense it is just so in regard to expressing a thing in writing, in figures or in drawing. It aids a man to express himself in an intelligent and scholarly way, in drawing, in diagrams, in lettering, and all that sort of thing, which are of use to him in after years. We have an engineer who is taking a course in a correspondence school, and he has become quite a good draughtsman. He sent some work not long ago to Scranton, and it all came back with the criticism that he must do all the lettering over again. The result is that he is getting so now he does very nice lettering. It is things of this nature with which a man becomes acquainted and possessed that are of immense value to him in after years. I simply say this because I joined the class and was benefited. Once I was in Mr. Clark's office in Philadelphia, and asked how many Connecticut men were in the class. To my astonishment, I was the only one.

On motion of Mr. Coffin a vote of thanks was presented to Mr. A. C. Humphreys for his paper.

Mr. A. B. Slater then read the following

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

Your Committee have considered the President's address and are very much pleased with the manner in which he has treated the various subjects touched upon, and believe it will be best appreciated by the members to carefully read it over and reflect on the several subjects considered.

His treatment of prepayment meters was well handled, and his conclusion that local conditions and circumstances should govern their adoption to much extent are right.

His reference to the plant at Everett was generous and timely, and its future operations will develop whatever success may attend it.

The President is to be congratulated on the able and considerate manner of the general tone of the address as a whole, and he retires from the chair with the hearty thanks of the Association.

A. B. SLATER,
H. A. ALLYN,
F. C. SHERMAN, } Committee.

The report having been accepted, the President called for the

REPORT OF COMMITTEE ON MINUTE TO MEMORY OF MR. CHARLES F. WARREN,

which was read by Mr. George B. Neal, as follows:

Mr. Charles F. Warren, one of the old members of the Association, died on the 11th day of this month.

Mr. Warren exemplified in a remarkable degree those traits of character which we all recognize as constituting an individual of sterling worth, both as a man among men and as a safe and successful gas manager. For several years Mr. Warren has been incapacitated by age from attending our meetings, but we have signified our regard for him by telegrams to him at our annual sessions. We shall always cherish his memory, and his example will always be safe to emulate.

GEO. B. NEAL,
A. B. SLATER,
F. C. SHERMAN, } Committee.

On motion of Mr. Allyn, the report of the Committee was accepted and ordered spread upon the records; also, that a copy be sent to the family of the deceased.

The President announced that the resuming of the discussion on the paper by Mr. J. J. Humphreys was in order.

Mr. Nettleton—I want to call attention to two statements made by Mr. Humphreys, not in any spirit of criticism, but simply that I have a different impression, and if I am wrong I would be glad to be set right. On next to the last page of his paper Mr. Humphreys states that "The danger of static electric sparks from belts can be overlooked except in the case of new belts." I do not question the fact, but we are having a good many sparks from our belts, and fearing an explosion I am trying to remove the electricity by means of a brush rubbing against the belts, and connected with the ground. A thing has developed in connection with this that is rather interesting. We have lately used a number of wooden pulleys, and the sparks jump from the belts across the wooden rim to the iron part of the pulley, in some cases being more than an inch in length. Surely, if the air surrounding that pulley were explosive, I should suppose that an explosion would take place, and that the reason we have not had it is simply that we have not had the proper mixture to explode. Another matter in Mr. Humphreys' paper is the lighting of purifying houses. Mr. Humphreys states that incandescent electric lights have been advocated as a means of lighting purifying houses and other places of equal danger, but that he is opposed to their use. Lately I have been into this subject quite carefully, and I have decided on two places to use them. Possibly I am making a mistake. There is a risk around a purifying house wherever there is light, but there are times when it is imperative that the house should be lighted. Shall we use a wall light with a glass in front of it, which may break at any time, and then have a naked light with the attendant risk; or shall we use the electric light in the purifying house, and, if thought best, cover it with a second globe, the same as the original Westinghouse incandescent street lamp, the bulb of the incandescent lamp inside another globe, which last is practically gas tight? By using care, using the best wire, putting the wires inside a metallic tube, putting the lights so high that the chance of hitting them is practically eliminated, using keyless sockets, having the switches outside, that no lamps are to be changed except when a switch is open, having the wires—if you are near the electric station—run underground, so that they cannot be struck by lightning. With these precautions, it seems to me that the risk of explosion is very much lessened as compared with gas burners in wall lamps.

Mr. J. J. Humphreys—Mr. President, electric plants seem to have sparks whether the belts are new or old, but my experience in this respect may be different from that of others. I have seen new, bright belts to get sparks, but not when the belt gets old—that is, the ordinary gas house belt, somewhat soaked with oil. We try to keep ours as clean as most of them, but they generally have absorbed some oil. I have never found any sparks with the latter, and I have tried several times to get them. Every time though that we have a new belt showing the bright, tan appearance uncoated we certainly have the sparks. Mr. Nettleton's experience is a revelation to me. Mr. Nettleton's way of fixing up electric lights is far in advance of other ways tried for lighting purifying houses. The main thing I wish to bring out is that we should not light them. In a purifying house in which the boxes are at all well proportioned the boxes should not come off, from the time they are first put in, faster than in about six days, say. With that time in which to change we don't think night work is very necessary, and there is generally enough reflected light to show a watchman through the house at ordinary times, leaving out of the question entirely the lighting of that point. When it comes to lighting oil rooms, Mr. McKay, I believe, if he will allow me to speak on his works, has his oil room fitted up like the magazine of a war ship, with incandescent lights protected just as Mr. Nettleton says, but also dead lights, which open from the outside only, and they seem to be entirely under a very responsible man's care as to lighting. I think he goes so far as to carry out another war ship precaution, of wearing rubbers inside the oil room, so that there will be no danger of spark. Personally, I don't think I want to light my purifying house at all under any circumstances.

Mr. McKay—The description of the lighting of the oil room of the Bay State works is not exactly correct. We have no incandescent light or electricity anywhere in the works. There is an open gas flame on one side of a special grade of glass, and no naked light of any kind is allowed in the oil room. There is no opening from the oil room into any building in which there is a light. The rubber shoes were used when working about the oil tanks because we found that the nails in leather shoes can strike fire either from brickwork and cement about the oil pits or tanks, or from the metal of the tank itself. Are the belts that Mr. Nettleton uses of leather or rubber?

Mr. Nettleton—Both.

Mr. McKay—We have found by trial that the rubber belts give off much less electricity, and in that respect they reduce the length of spark and tend towards safety. As to the lighting of the purifying

house: At one time we had installed in our purifying house an electric gas lighting arrangement, the moving of one button lighting the gas, the moving of another shutting it off. I turned off the gas in that way on one occasion and tried to light it again immediately afterwards. Although the flame was extinguished the gas had been issuing, and the mixture in the chamber, being just right, exploded, breaking the glass (which is about half an inch thick), and scattering it in very fine fragments all over a room about 60 feet wide. So we have lighted the gas jets either with matches or a torch since then. One item about illuminating spaces containing vapors and explosive mixtures can be mentioned. When vessels carrying oils have steam power on board, so that they can operate their own electric light on board the ship, they use an incandescent bulb to examine the tanks when unloading at night, or when doing anything about the tanks at night. They will open the hatch and drop the light down inside without any fear or any further precaution, saying that, if the glass breaks, the incandescence of the filament ceases and the temperature is immediately reduced so that no explosion can occur.

Mr. Allen—We had an experience in lighting a purifying house out at Allston with incandescent lights two years ago. Two incandescent lights in our purifying house were used as night lights; the switches were outside. On our first box the seal was a little low, and that box blew, filling the room full of gas. Two or three men undertook to enter the room to fill the seal again, and they were obliged to get out. They opened the windows and tried to ventilate the room. We were obliged to shut down. We turned the switch from the outside, shutting off the lights. If we had been using gas instead of electricity there would probably have been an explosion. Since that we have taken the precaution to go all over our wiring, and have *all* fuses outside, and have no little fixture where you can shut on or off at the burner. In some places, like our naphtha room, we inclose the lamp with another globe, which is airtight, also watertight. In my experience as to lighting with gas and electricity, I prefer electricity.

Mr. Sherman—I would like to ask Mr. Nettleton if he ever had occasion to use a light in his purifying house.

Mr. Nettleton—I have had occasion frequently to get light from a lantern outside the purifying house. I am so fixed that my exhauster, condensers and standard washer are under the same roof with the purifiers, merely separated by mortar partitions from the purifying room. Whatever means I may take for lighting the exhauster room, I must be as careful as if the lights were over the purifiers, as the risk of explosion is practically the same in both places.

Mr. Sherman—A blowout in our purifying house is no unusual thing. Within the last three years we have had plates on our purifiers crack and let out all the water in the seal, but we did not find it necessary to use any light. Our men could manipulate the valves without any light. In fact, we instruct our men to keep away from the purifying house with any sort of a light. In 1870 the purifying plant of the Worcester gas works was destroyed by an explosion caused by a workman entering with a lighted lantern. The recent explosion at Poughkeepsie came about, as I understand, in this way: They had had a blowout in the purifying house, and the gas came in contact with the open lights in the boiler room. The door between the purifier house and the boiler room was open.

Mr. McGregor—I have used incandescent lights in my purifying house for the last three years, and I am indebted for the idea to Mr. Learned of Newton. The lights are inclosed in a glass globe, which prevents contact at all with the outside atmosphere. Although we don't mean to use them, there are some occasions—possibly once in a month—when we may be so caught on a purifier as to render it necessary that we should change it. We have the switch arranged so that it is turned on from the outside of the building. I have never seen any occasion yet to regret putting in the incandescent lights, and I believe it is the safest method of having light in a purifying house. In fact I would not be without incandescent lights in my purifying house.

The President announced that the discussion was closed, and introduced Mr. H. K. Morrison, of Concord, N. H., who read the following paper on

## ADVERTISING.

Advertising is profitable, always has been and always will be. It is no new thing; but, as an art, rapid progress has been made since the first specimens of record. I cut the following from "Profitable Advertising":

"Amid the historic ruins of Pompeii may be seen to-day the earliest form of written advertisements of which the world has any knowledge On several street corners of the famous buried city there were placed, a couple of thousand years ago, a number of small boards on which characters were rudely scrawled, and when the old town was dug out of its untimely grave these boards were among the curiosities that claimed the attention of learned antiquarians. The result was that they were discovered to be of a precisely similar character to the billboards of the present day, the legends covering them being nothing less than advertisements for plays, gladiatorial exhibitions, baths, inns and various other matters to which it was deemed feasible to give publicity in those days. And not only were boards specially erected as mediums for these announcements, but the walls in the most frequented portions of the town were also utilized to attract the attention of the passing public.

"One of these ancient billboards contains a hotel advertisement that is still perfectly legible. It is, however, interesting more as the earliest of its kind extant than as a model for hotel keepers of the present age to follow. Still, it has its good points, not the least of which is brevity.

"Leaving the billboard, and bridging a chasm of about five centuries, we find ourselves in the era when advertisements first began to make a timid appearance in the columns of what were then called newspapers. At this time about the only articles advertised were books, real estate and fugitive slaves, although the primitive manufacturer of proprietary medicine was not slow to see the advantages of the press as a medium through which to place his wares before the public, and he accordingly became the first regular user of newspaper space. And he is still using it.

"The first advertisement to appear in the United States was published in the initial number of the Boston *News Letter*, April 24, 1804. It was an announcement for the publication itself."

With this brief look into the history of our subject, let us take up a few of the usual methods of keeping our goods before the public, hoping thereby to provoke a spirited and profitable discussion of the matter. We will use the term in its broadest sense.

*Office or Show Room.*—An office on the main street of your city, with good large show windows, will be of great value in advertising the many appliances which are helping us to increase the sales of our product. There is where we meet the people, take their money, hear their complaints and show gas used in every way possible.

Such an office properly equipped would be an attraction during the day where the ladies would be glad to drop in and find a place to rest; and still more so at night, when brilliantly lighted, it will not fail to catch the attention of all passers by. An office and showroom where we can thus exhibit the possibilities of gas seem nowadays a necessity.

*Street Cars.*—For those who are fortunate enough to have an extensive street car system here is a chance to place a catchy "ad." that will be sure to attract the eyes of the ladies. A bright colored lithograph, illustrating some use of gas, would be best and could easily be adapted to the season of the year. In summer we would show cooking by gas. In spring and fall, heating by gas. In winter, the best and most economical light, gas. These lithographs can no doubt be purchased from some advertising concern, or designed for you by any of the large houses which make a specialty of it.

*Bill Boards.*—Every kind of business under the sun uses this means of advertising; but we don't. We have seen the incandescent gas burners so shown, but not the gas business directly. In 1895 a certain make of cigar was advertised on the bill boards. After four years' of advertising in this way exclusively, the sales amount to $32,000,000 annually. Others have found it as successful. Why do not the gas companies avail themselves of the chance? We are sure a big, striking ad. would take.

*Programmes.*—The custom of paying for programmes for concerts, fairs and the like by the advertising matter seems to be a popular and growing one. We are asked to take space and are assured, if we hesitate, that we will be sure of increased patronage. Our good friends of the programme will take out the cost of the ad. in trade. Never mind if they don't! Keep at it! Keep before the people all the time that we are in business to sell gas as a commercial article, and that there is no problem of light, heat or power upon which we can not throw *light*.

*Gas Bills.*—It will be difficult to determine the proportion of people who ever peruse the reverse of a gas bill. Judging from public opinion, a majority are sufficiently shocked at the story the conscientious meter tells on the face. However, we can put some matter on the backs of our bills that will perhaps distract their attention. If you have rules and terms, relegate them to a small space, and, as one man puts it, make the rest of the space look like a "circus poster."

*Envelopes.*—One large concern uses its envelopes to advertise incandescent lighting entirely. We have a chance here to show on our local

mail matter some part of our business at least. A cut of a range in summer would take. Vary this in winter and at other seasons. Don't forget to talk gas more than mere appliances.

We find on the reverse a lot of space, too, that can be utilized. Why not do it? Surely we can find plenty to say about the comfort, economy, necessity of using what we offer the people.

*Gas Cook Books.*—No one ever had any trouble in giving away a cook book, and a cook book can be filled with all kinds of persuasive matter, all kinds of cuts that will not only catch the eye but help carry the point, while no doubt the prospect of a tempting dish will make the whole more attractive. These books eventually reach the cooks; just the people we must educate to want gas in the kitchen.

*Exhibitions.*—Local fairs or industrial exhibitions often give us rare opportunities to burn a few thousand feet of gas. With an attractive and varied show, in charge of a fluent talker, a great work can be accomplished. We can show lighting and heating and cooking, at least to the disadvantage of all competitors.

*Circulars.*—We are all familiar with the circular or folder in some shape or other. They vary from vest pocket editions to the size of a newspaper, and take the form of a book or simple one leaf circular.

Some are all pictures, some are all reading matter; all are useful when properly placed in the hands of the people we are after. The important question is, "How shall we place them?" bearing in mind that advertising matter of any kind that finds its way into the waste basket unread is not profitable.

Shall we hire distributers and have the circulars left at every house, pushed under the front door, or thrown in the yard, just as every other kind of a circular is? Many attach the matter to the gas bill and forward both through the mail. Distributed in this way they are more likely to be read by the consumer.

The writer has tried both ways, but finds a better method to place the circulars in the hands of the canvassers to be left by them wherever a chance to talk has been gained. A circular so used should be designed to show cuts of the goods to be sold, stoves or heaters, giving a brief description of them, with possibly a few figures as to size. It is well to add some reading matter that will recall to the mind of our fair customer the arguments of the canvasser when later on she presents the case to "My lord."

*Newspapers.*—This is an old story, and we hear from all sides that it is done simply because it is policy. So it is; but at the same time it should be made profitable. "The sign over your door is intended as an advertisement to passers by. An advertisement in a reliable newspaper is only so many thousand signs spread over a great many square miles," says the magazine already quoted.

We take a four-inch space perhaps daily in our local papers and forget as regularly as the months go by to change it. "As rust grows on iron, so does moss on an overexposed advertisement." These small spaces are all right and do good work, but they are not enough. Try half a page about the time the stove business begins. You may have some second-hand goods to be disposed of on special terms. Repeat it with different material three or four times during the season. Let the matter be brief and to the point, and the space so chosen that one can't help seeing it and being impressed at a glance by what it conveys. A good cut always helps, provided, of course, it is appropriate; not simply a picture. "It is not always the ad. that looks the prettiest that pays the best." "Last impressions stick. Put the strongest point last."

*Calendars.*—The giving away of calendars has been tried with success by several companies. You give something away; that is an ad. in itself. For every month in the year you have something different to say. "The fire is always ready." "Cool kitchens are always found with the gas range." "Housekeepers' cares are reduced to a minimum by using gas." "Place a radiator in the kitchen and use gas all the year round." "Inspect your gas burners." "We have tried to serve you well and hope we have succeeded." These are some of the reminders we find on a calendar placed in the hands of many this year by one company.

*Concessions.*—Premiums, concessions and special schemes are all legitimate methods of advertising. A large shoe house finds the sale of a certain shoe at a loss the best way to create a demand for other goods. But a few years ago the giving away of a stove was an unheard-of thing. Now we are all busy making concessions of one kind or another with a view to getting quickly what might otherwise take us years to accomplish.

*Canvassers.*—Given, gas to sell, and smooth, smart solicitors, and we have no trouble to make sales. We are all agreed on this point, I am sure. A man who can get his heel in the door, his foot, push himself in, and finally, after a half-hour of conversation, come off triumphant with an order for a stove, a heater, a house to be piped, he is profitable indeed. It would seem this persistent house-to-house work, by the properly qualified men, aided by all kinds of literature, is a method that will give the quickest and largest return for our investments in advertising. We touch the people in this way as in no other. Our friends are made, as well as our goods sold, and we pave the way to that time when our customers will do more for us in advertising than we could accomplish by any other means.

*Cooking Lectures.*—We spoke of giving something away. Here is a chance to do it gracefully and in a way that never fails to please. It is an old story to many of us.

Hire a suitable ground floor, hall or store. Use the ranges you propose to push. Provide paper and pencils for taking notes, fans if it is hot, and comfortable chairs. Get the best teacher to be had. Give the afternoons between stated hours to the preparation of certain dishes which are not only to be seen but tasted. You audience will be of the best as a rule; the very ones you want to do your advertising by-and-by. If you can arrange it, have a day for cooks only, and prepare the dishes the average cook so often fails on—bread, cake, pastry, etc. If the cooks were only all for us! If when the "lady" applies for a position, and the "woman" of the house says, "We don't cook by gas," this would insure a speedy visit to the gas office!

But the lecture must be reported. Here is a chance never to be lost of getting in a half column or more daily of the very best kind of an ad., and it costs nothing but what you pay for the manuscript. Don't rely on the reporter; get some lady to do it. Let me quote from such a report which I was fortunate to get hold of: "Now let good digestion wait on appetite, for the queen of both is in town. The gas company, which never lacks brilliancy and attractiveness, is now the center of attraction for all who eat to live. At.....the.....Company throws open hospitable doors to the public every morning and afternoon, when a fair and gracious lady shows her eager audience how to cook in mid-summer with comfort and ease. The happy and triumphant members of the gas fraternity adorned the scene, content that whatever is doable can be done by means of a gas stove, which may serve with equal facility and success as a roaster or a refrigerator, broil a chicken or freeze ice cream. No one felt disposed to dispute the claim when slices of roast beef, rare, juicy and tempting, were followed by generous helps of ice cream, both emanating from the same magic source of light and power. Grace and dignity on the platform, comfort and ease in the chairs, courtesy and cordiality in the chivalrous knights who watch over the welfare of all, combine to present an attraction not easy to resist when once experienced."

*Our Customers.*—Happy the man and successful the company which have arrived at the point when kicks are no more, the complaint man gone and our customers selling our goods for us. Mrs. "A." has a stove and Mrs. "B." secures one just like it. Mrs. "C." heats that cold room by a gas radiator, and Mrs. "D." has to have a heater of the same make. Mrs. "E's." parlors are so bright and cheery under the incandescent lamp, with the many colored globes and so warm in the glow of the gas grate, that Mrs. "F." and Mrs. "G." and Mrs. "X." and "Y." and "Z." must have the duplicates.

*In General.*—Quoting again: "Mr. Alfred Mitchell, of Derby, England, actor, banker, editor and advertising solicitor, a few days ago in Cincinnati, Ohio, said to me: 'Sarsaparilla! Now is it not a fact the instant I say that word it occurs to you that I mean Hood's Sarsaparilla?' I replied that it did, and added I could not tell why. ''Tis this,' said he, 'Ten chances to one you never read any one article on the merits of Hood's medicine, but it has been ground into you by incessant and elaborate advertising. If I said to you,' he continued, 'Good morning, have you used——?' you would undoubtedly supply the words, Pear's soap; but to tell why you could not. You have seen Pear's soap and Hood's sarsaparilla everywhere. Why the chances are almost infinitesimal, but that if you were shipwrecked you would see a signboard in the water on which to cling, reading, Hood's sarsaparilla for that sinking feeling.'"

Be it our aim to so keep our business before the public eye that should the query ever be made, "Do you use——," the missing word, as sure to spring from every lip, will be gas.

An ad. was handed me recently, from Mr. Elliot, of Jersey City, which is worthy the thought and trial of all. He has found it eminently successful. The idea is to advertise your product in the lowest possible unit, *cents per hundred.* Your friends, the oil man, the electric man, the kindling wood man, sell by cents per gallon, cents per kilowatt, cents per bundle, while we talk dollars per thousand. Why is it 98 cents seems so much less than a dollar? Why do we sell more gas

when bills are rendered monthly? Why does the prepayment meter gain a customer, when a monthly bill will never appeal to him? We must conclude that it is because of the smaller figure—cents instead of dollars.

In closing, the writer wishes to thank the 26 members of this Association who so kindly furnished the material he asked for. Some 40 were addressed; but very few owned up to having found advertising did not pay, due to some particular local circumstances. Some have not yet entered the field, but are considering it, and will, no doubt, upon their return home. We want to hear now from the 14 who failed to respond.

We find many of our New England men who are in advertising for all it is worth, and we believe that the record of increase in sales in these places will be sufficient proof of the proposition with which we began this paper, "Advertising is profitable."

*Discussion.*

The President—I am sure we all enjoyed that paper, for it is one we shall undoubtedly read when printed, and use some of its recommendations. I know that some present have undoubtedly had experience in advertising which they would like to tell us about.

Mr. Allyn—To start the discussion, Mr. President, we are of the guilty ones who pleaded that we had no experience whatever in advertising; that we had usually depended on the people who furnished us with stoves, ranges, etc., to furnish the ammunition, and we distributed it as well as we could among our customers. However, I think I have gleaned many valuable ideas from Mr. Morrison's paper. I believe that our Treasurer is here to-day, and his attendance at the meeting was solely prompted by the desire to listen to the paper on advertising.

The President—Will Mr. W. A. Learned give us something about his experience on advertising?

Mr. Learned—I know very little about it. The way we do is to get the brightest solicitor that we can, sending him from house to house to sell the different gas appliances. We have tried advertising in the paper and by circulars, but found the best way was the one I have reported.

Mr. Coggeshall—We have a man canvassing the city in every street where we have mains; we have gas mains in 60 streets. He is getting the names of and numbers in the family, and the number of the house, preparatory to making a canvass of the city to sell gas stoves when the weather becomes warmer. On the 1st of March I am going to send him out to Chicago (we get our ranges of Messrs. George M. Clark & Co.), to spend a month in their factory getting all the points he can in that limited time, so he will know what the stove is and talk thereon with confidence about it to the people. When he comes back he will take a street and canvass it for selling stoves. In the meantime, when he goes into houses where there are gas stoves, being equipped with a pair of pliers and a supply of burners, if there is anything the matter with the burners in use he introduces himself by cleaning them out or by putting on new burners for poor ones. I am in hopes he will accomplish good results for us. I have had canvassers out for the last two years, and we have been fairly successful in selling gas ranges, but not as successful as I want to be. The outlet for increased summer sales of gas with us must be in the line of kitchen use. We have all the plant and force necessary to supply the needs of our city. With his lists our canvasser knows right where to go. In fact, he is at present doing a little preliminary work in the instance of visiting families who use gas stoves. We are going to extend our mains the coming year. I received recently a calendar from the United Gas Improvement Company that I thought was so taking that I ordered 1,500 of them printed for us, marked with the compliments of the Fitchburg Gas Compapy. Those I am going to send out. I also have made a list of every party in our city who uses a gas range, and I purpose to have that list printed and sent to every name that appears on our canvasser's list.

Mr. Taber—It is a good many years since we began to introduce gas stoves. I well remember my first attempt at it. It would seem a very crude proceeding now. But we started in the old office way down town and I put in a gas stove, and every party who came down to pay his gas bill was invited to take a cup of hot coffee, colored with cream, made on the gas stove. That was our first attempt at it. But I found afterwards—and perhaps I may be very rusty in the matter—that a woman who has tried a gas stove and will recommend it to her neighbors is the best advertisement we ever had. I quite agree with the gentleman from Fitchburg that advertising the names of those who have gas stoves will go a great ways in this matter. There is no question about it; so far as gas stoves are concerned they will introduce themselves when they are well known. In regard to other matters. When I had the care of some of the solicitors in one of the big cities round here we had a regular system of looking up every new house that was built, seeing that it was piped large enough, and the old rule in New Bedford was not to pass a house that didn't have a large ½-inch gas pipe to the kitchen to allow a gas stove to be placed in there. We insisted on that as a requisite for passing the job. In that connection, and knowing that this was coming up this afternoon, I was curious the other day to know what success had followed the idea of "advertising," by comparing the different consumption in different cities. You know we often hear that a given town has a certain population and, therefore, uses or should use so much gas. It is a singular thing that even here, right round Boston, it varies so far as it does. I took a list of 11 towns in Massachusetts, and it may interest some people as showing how little attention has been paid to the development of this gas industry to know that the sale per unit of population in one of the towns goes down as low as 380 feet to the individual, while in another case it runs up to 3,140. These towns, all of them, are towns of from 20,000 to 30,000 inhabitants, and are well known. I could read a few of them. One is 900 feet; one is 870, 2,660, 1,940, 1,230, 1,550 and 750. I was interested also in knowing about the suburban neighborhood around Boston, and here it would seem as though, taking Boston proper out, we might find another unit that would not be so variable; but I find it varies almost as much, for in these towns, as Cambridge, Waltham, Newton, Jamaica Plain, East Boston, Chelsea, Malden and Charlestown, they vary from 900 to 3,140, showing that there is a chance for improvement even among some of these.

The President—The ratio per unit of population is a very interesting subject, which is rather apart from the advertising question, though of course advertising would make a difference also in that ratio.

On motion of Mr. McGregor, a vote of thanks was tendered to Mr. Morrison.

Mr. Frederick H. Shelton (Phila., Pa.) then read the following paper on

## THE NUISANCE QUESTION IN GAS WORKS.

Having recently been in part responsible for the design of a new 10-inch gas plant, situated in a high grade suburban community in which it was quite desirable to avoid any question of nuisance, the following notes are offered concerning the precautions which were taken in the design of the plant, to the end that there might be no ground for complaint against the works. A few thoughts on the nuisance question in general may first be *apropos*.

While land may commonly be used for all ordinary purposes without giving ground for complaint from those adjoining, there are certain numerous purposes and industrial operations, however, for which real estate is used that are not looked upon by the courts as ordinary occupations, but which, unless sufficient precautions are observed, may, can and often do, constitute what our legal friends term a "private nuisance." Instances are, abattoirs or slaughter houses, chemical works, swine sties, glue works, etc., etc. In at least one instance it has been held that the use of ground for manufacturing gas is not a "common purpose," and that such constitutes a nuisance, *if* the operation of making gas injures the property or business of those adjoining. Such injured ones can maintain an action for damages and look for judgments in their favor. That such suits are not uncommon is well known. While of course the circumstances of each case are the controlling factors that determine the outcome, and decisions are on record both ways, in such matters, and while at times gas companies have successfully resisted such suits, the general trend of the decisions in such cases undoubtedly is that a gas company must conduct its business and operate its plant in such a way as will not injure its neighbors.

It is not enough to claim that the location is in a district of kindred or other manufacturing industries; or that the business of making gas is a semi-public function or necessity, and that some injury must be borne by a few in order that the general public may be benefited; or to claim that all usual and possible precautions to avoid being a nuisance having been taken, the city and the public, after licensing the company to make gas by the customary methods, must stand the results. If real injury is done any individual, and such can be shown, the chances are that he can secure damages from a gas company. This seems to be the net result in practice, and in view of it, and the fact that a prosperous gas company as a corporation is more or less apt to be a target for unprincipled individuals, if a handle can be found upon which to base an action, and the still further fact that before a jury such a corporation often unfairly gets the worst of it, it is obvious that it behooves a gas company, whether large or small, to plan, construct

and operate so that no nuisance can be shown because of such not existing.

It is clear that just what constitutes a nuisance is an important question. It has been well defined as "that which offends an ordinary man, but not a delicate nosed one." In practice it is usually left to a jury to decide whether a given alleged annoying act constitutes a nuisance or not.

The following, among other things, have been ruled as constituting nuisances, in certain cases at least, and no doubt there are others which have not come under my observation: The pollution of private wells adjacent; the pollution of State streams under the protection of the Fish or Game Commissioners; the pollution of rivers used for the water supply of cities; the emission of noxious fumes that were alleged as destroying adjacent vegetation; the emission of constant quantities of smoke and cinders or odor, steam and other noxious vapor rendering adjacent dwellings not reasonably comfortable habitations; the jar and vibration of heavy moving machinery, such as an electric annex could induce. All of these have been ruled upon as nuisances for which divers gas companies were held responsible.

On the other hand, there are matters which, while undesirable, no doubt for adjoining property holders, are yet, however, not such active nuisances so-to-speak as to be ordinarily looked upon as such by the courts and matters upon which decisions generally favorable to the gas companies have been rendered. For instance, the mere location of a gas works in a certain district, even although the fact may depreciate property values, is a thing not in itself a nuisance, unless the *operation* of the works causes damage. The construction of a large gasholder, perhaps shutting off some light and air from a neighbor, or obscuring other people's signs, or defacing the landscape, will not ordinarily furnish adequate ground for successful action. Further, the storage in such a gasholder of "large quantities of inflammable and explosive substances" (a favorite claim of those who assail gas companies with ulterior motives) is not usually sufficient cause for a suit. It has been distinctly ruled that, even with only the most ordinary and customary care, the chances for the explosion of such a vessel are too remote to make it right or proper that the gas company should be enjoined from building a gas works where it finds it desirable to, or from constructing such a holder, or is adequate warrant for saying that such a vessel constitutes a real danger, menace or nuisance to the neighborhood.

While such and other points are no doubt at times made the ground work for suits, the real question in such cases is apt to be whether or not the plaintiff can successfully maintain an attack on the gas company in that guise. If the latter class of questions be decided on equity and precedent, gas companies will ordinarily win such suits.

The causes that are commonly looked upon, however, as sufficient ground for complaint and legal action, if causing damage or injury to adjoining property holders, are these: Smell, smoke, noise, refuse matter or drainage.

Smell may come from various causes, such as: (1), leaky oil tank or pipes, or open oil tank vents, or oil cars; (2), saturated earth where oil is spilled in unloading; (3), drip water not properly disposed of; (4), foul water caused by the blowing of holders; (5), escaping gas from purging water gas apparatus; (6), escaping gas from opening purifiers, etc.; (7), vapors from spent lime or foul oxide; (8), tar wells, etc.; (9), tarry sawdust or breeze from purifiers.

Smoke may come from: (1), the operations in a retort house; (2), the boiler stack, and (3) sometimes the discharge from the stack of a water gas apparatus when purging, which discharge, however, is really unconsumed crude gas.

Noise may come from: (1), a fast moving fan or blower; (2), exhaust steam from rapidly moving engines; (3), a coke crusher or conveyor, or electric or other machinery; (4), purging a water gas apparatus; (5), small explosions.

Offensive refuse drainage may come from: (1) unintercepted scrubber or condenser wat r saturated or laden with ammonia, tar or oily scum; (2), tar or oil wasted; (3), the rain washings of spent lime or old oxide; (4), general gas works and surface drainage; (5), drip water not properly disposed of.

The 10-inch plant to which I referred in the first paragraph of this paper, is a water gas plant, and the following description of its plan and operation will indicate the provision made against most of the items above and possible causes of nuisance.

*Smell.*—Unloading oil is effected by pumping out through the dome of the tank car, instead of from the bottom. The valve under the car is never opened, neither is a hose used. There is no chance of spilling more than a few drops of oil instead of a gallon or two every time a car is unloaded, until the earth and ties around the railroad switch become permanently saturated and give out odor. When the car is empty, the railroad company is immediately notified and the car is not allowed to stand round for a day or two.

The oil pipes are tight, and kept so by frequent examination; and so is the storage tank. The vent of the tank further connects to a gas main and not to the atmosphere. The oil and all oil vapors, in brief, are practically "bottled" up throughout.

All overflowing seal water from seal pots, etc., is led by proper pipes to the "tar separators," which are covered with close lids, affording no free escape for the odor or vent into the atmosphere.

An 8 inch electric alarm bell is located and connected in the gas making room so that it rings loudly when the gasholder is considerably inside the point of "blowing." The idea is to never permit the holder even for a moment to unseal, blow, or allow the oily scum on the surface of the water inside to get to the outside, where it would foul the outside of the holder and evaporating cause an odor hard to get rid of. The water from all pumped drips is poured into the tar separators and not anywhere.

Purifying odors are guarded against largely by the use of a weather vane, in connection with injunctions to the foreman that box must not be opened unless absolutely necessary if the wind is blowing towards the one direction in which there are a few residences. The purifying house is, moreover, provided with swinging, glazed sashes above in the ventilator, so that if the opening of a box cannot be deferred the purifying building at any rate can be closed and the odors to a greater or less extent held within for a time, or, until the wind, perhaps, shifts.

While not as yet done, it is further proposed if necessary to connect the purifying building with an exhaust pipe (operated by a steam jet to induce a draught) with the idea of drawing off artificially the foul air within, and perhaps filtering it or else discharging it at a point on the premises where it is at least offensive; or possibly in some way diverting it into a stack in conjunction with heat to reduce the odor.

The oxide is revivified either in the boxes or on the ground floor beneath. It is not left out doors to revivify, unless the wind is in a safe direction.

Pressure gauges from the purifiers are under the eye of the gas maker in the gas making room, so that the pressure on the purifying seals may always be easily noted and their blowing avoided, if such tendency at any time arises.

Smell from the gas that is left in the water gas apparatus at the end of a run, which gas is blown out of the stack upon opening the blast, is avoided by having a small pilot light close to the stack outlet. It is constantly burning and ignites the gas as it emerges, causing it to be consumed without odor, instead of allowing it to disseminate in the atmosphere as it otherwise would.

The material used on the lower trays of the purifiers for protecting the oxide, such as coke breeze, planer chips, etc., and which, upon being removed, is usually saturated with highly odorous tarry of oily matter, is definitely burned under the boiler, instead of being dumped anywhere outside and allowed to contaminate the atmosphere.

*Smoke.*—Smoke at the boiler stack is avoided by the use of cheap anthracite (pea or buckwheat) coal. If the works were so situated as to make it desirable to use soft coal, the boiler would first have been designed of ample capacity and plenty of grate service in order to fire easily, and if necessary would then have been supplemented with some one of the various devices or "blowers" used for the purpose of avoiding smoke in the burning of soft coal. The so-called smoke often found in the use of crude oils at the outlet of the water gas apparatus upon purging, but in reality gas, is not in evidence, as it is ignited by the pilot light already mentioned.

*Noise.*—Noise is reduced to a minimum by a purposed arrangement of the blower in a room within a room, or so surrounded by intervening rooms that its hum or whir is not noticed, either on the highway or in the residences in the neighborhood.

The exhaust of the engine in the works in question is quiet. If it were one of the rapid, puffing, noisy variety, one of the numerous "mufflers" on the market would have been added to subdue the sound.

The matter of noise or "roar" at the stack of the water gas apparatus, as well as occasional small explosions within the same, is largely a question of proper or improper manipulation of the valves and operation. The avoidance of noise on this point is chiefly a matter of education and instructions to the gas maker, and the latter at the works in question are brief and to the point.

*Offensive Refuse and Drainage.*—All water used in scrubbing, and all water that comes from the various seal pots, overflows, etc., containing whatever tar or oily refuse matter is made in the process of

manufacture, is led to the "tar separators" already mentioned. These are rectangular, well built wooden tanks or vats buried in the earth, having removable, plank, closely-fitted tops. They are so designed with proper partitions, baffling boards, compartments, etc., that the water flowing into them passes through but slowly, and in this passage the tar is intercepted and precipitated to the bottom, to be afterwards pumped out into barrels, and sold or otherwise disposed of. If any free oil appears on the surface it will be caught and skimmed off and returned to the oil tank. The water after being cleansed as above, is then pumped back by a circulating pump, and used over and over again through the scrubbers and seal pots as before. The result of this is that no considerable quantity is constantly flowing off or consumed, but only a small amount, say 3 or 4 gallons per 1,000, needs to be taken care of. This is so clean that it is allowed to go into a small creek in the rear of the works, as no pollution ensues. An ordinary cesspool takes care of the office and closet drainage.

The above precautions, it may be observed, involve no material expenditure or equipment over the ordinary. They are rather only the result of thought given by the management (of which I am but a part) to the plant's detail and operation. It is not expected that there will never be any noise, nor an odor, nor an atom of free carbon uncaught in the works, but it is felt that in the main the precautions noted are sufficient, and that with their general observance, and especially with *getting in the habit from the start* of avoiding smells, etc., the works in question will not afford grounds for any material complaint, let alone sufficient grounds for possible action for damages.

The matter of appearance was also carefully considered, not that it was especially necessary, but it was felt that it would gratify the neighborhood, be an evidence of the intentions of the management, be in harmony with the precautions already referred to, and be good policy in general.

The principal buildings are of stone, which in time will be vine-covered. They are located as far back from the highway as possible. There are no windows on the street frontage, nor opportunity for broken glass, overalls, or unsightly objects from careless workmen, to be seen around the working buildings.

The detached stone office of pure colonial architecture, and considerably more pretentious than the homes of many of the Company's customers, is located well towards the front.

The gasholders are painted in tones of gray, instead of the usual red, in order that they may not be a color blotch on the landscape. The premises in front are enclosed by a cedar-post fence with pipe rails, and in conjunction with more or less honeysuckle vines on the posts, considerable lawn, neat walks, and a flower bed or so, present a most attractive frontage.

Taken in conjunction with the fact that the schedule of operation calls for no night or Sunday work, and the precautions against noise, smoke, smell or drainage already referred to, it is felt that the plant is materially better throughout than the average gas works, and about as inoffensive as any manufacturing plant can be.

*Discussion.*

The President—Gentlemen, we expected that the plant with which Mr. Shelton was concerned in erecting would be about as perfect as a plant could be, as well as inoffensive. Has anybody any experience to relate regarding the objections ordinarily raised against gas works arising from odors, drainage, etc.?

Mr. Allyn—In order to start the ball rolling, let me say that when I took charge of the Brookline works one of the first things I was called upon to do was to build a new purifying house to cover a new set of purifiers. The old purifiers, if I remember rightly, were about 5 by 8, and of course the smell that they created was not offensive enough to raise any particular hue and cry in the neighborhood; but when I came to put a set 20 by 20 at work I immediately had the whole town on my ears. Threatened with injunctions and prosecutions and all manner of dire things, I found I had to do something. At that time, of course, oxide was not under consideration; we used simply lime. I thought the matter over for a while and finally thought I would try a steam-jet exhauster, so I connected my purifiers together with a 6-inch pipe and the necessary valves. We had an old stack there that had formerly been used to take the waste gases from the retort house, but it was then out of service. I connected the steam jet with this stack, and my trouble in that respect all passed away. By steaming the purifiers for five or six hours after they were turned off, all the fumes were carried up in the stack, and we received no further complaints.

Mr. Morrison—Mr. Shelton's remark that he was going to put the blower inside of two rooms to kill the noise, puts me in mind that I once found my gas maker suddenly dropped off a few thousand feet to the run in his make, and kept it up for two or three days. We finally discovered the trouble was that he was not getting any air into his blower—he could not get any out of it unless he got a little into it. He had to open the windows to get some of the air in, and that of course let the noise out.

Mr. J. J. Humphreys—I would like to ask Mr. Shelton the way he would apply heat to the stack to draw the waste gases from the purifying room. Of course, some people advocate passing it right through the boiler, but other people don't like it—I am one of the others—and I would like to know what his method is, his methods usually being ingenious.

Mr. Shelton—Replying to Mr. Morrison I believe that one can procure all needed air from sundry directions and yet prevent the sound from going in any one direction to a sufficient extent to annoy. In this particular case we are so situated with the surroundings, rooms, etc., that we are satisfied there will be no complaint from noise, although the air does get into the blower. Mr. Humphreys should bear in mind that my paper said, if it proved necessary, we were disposed to rig up an arrangement for exhausting the odors from the purifying room; as to what disposition would then be made of them I am frank to say has not been determined. There are, of course, obvious objections to turning the contents of a purifying room into the presence of fire or sparks. The results might be disastrous to an extreme. On the other hand, it may be possible—I can see how it could be possible—to so connect to the outlet of a boiler setting (with some sufficient arrangement for intercepting sparks and insuring that no ignition could take place) as to utilize some of the waste heat of the stack, perhaps, to reduce or to help dilute or thin out this foul air that one may be drawing from the purifying room. I am perfectly frank to say just what form that arrangement might take—if it is possible—I have not yet worked out sufficiently to satisfy my own mind. I think an application of even plain steam heat, and a liberal use of it, would be sufficient to materially help the weakening of the foul atmosphere. Another thought in that direction was suggested in the paper, which is simply that of purifying the foul air that might be exhausted. The amount of actual bad matter in that air would be very small. A comparatively small old box, to my mind, would for a long time catch the foulness in such exhausted purifying house air and would be very inexpensive to rig up. I do not profess to point out any particular plan of doing it. I dont know that it would at all be necessary in the location of the works that I have in mind, but it has been done. The artificial drawing away of the foul air products of the purifying room has been done, as Mr. Allyn, among others, has pointed out, and in some form that scheme can be applied to the case that needs it; but the particular case would have to determine what form, I think.

The President—I believe when a gas works is located near a dwelling house, or where there are dwellings in close proximity to it, the changing of a box is extremely disagreeable to the neighbors, not only when the box is changed but also when the iron is turned. Every time the iron is turned there is neither a sulphurous nor an ammonia smell, but simply the pure gas smell, which is not only disagreeable but thoroughly obnoxious to certain persons. Some people are made sick by the smell of this purifying material. If that could be removed by simply taking up 50 to 100 feet, it would be a very easy thing to do, but it does not seem to me that that would absolutely do away with the difficulty, though it did in that case, as I understand it.

On motion of Mr. W. A. Learned a vote of thanks was passed to Mr. Shelton.

Mr. N. W. Gifford, of New Bedford, Mass., read the following

## NOTES ON THE USE OF SUPERHEATED STEAM FOR BURNING CARBON FROM RETORTS.

The accumulation of carbon in the retorts with its removal is one of the nuisances attendant upon the manufacture of coal gas. Of course we all run our benches so as to keep this accumulation at a minimum, yet every few weeks each retort in the house must be thrown out of use to have the carbon burned out. During this time there is a loss of production, while the expense for fuel and labor is just as great as though all the retorts were in action; so that in a stack of 24 retorts it is not impossible to find any one of them on carbon nearly all the time. This would mean a loss of 4 per cent. in the efficiency of the working. This may seem like bad practice, but I imagine most of you have seen as bad cases as this.

Then there is the still further loss by the retort being damaged by the long continued internal firing necessary to remove the carbon. This lost time in a straight coal gas works may sometimes be so

arranged as to be taken up at periods when it is desirable to hold back the production for some reason; but where there is a water gas auxiliary, or where ample storage admits of the continuous working of the retorts up to their maximum capacity, this lost time is so much waste to be avoided as much as possible.

It is not necessary to call attention to the various methods of forcing the required amount of air into the retort, but a very common and convenient one is that of blowing it in by means of a steam-jet thrust into the open end of a piece of old 3 or 4 inch pipe laid on the bottom of the retort.

It, however, not unfrequently happens that the steam in the piping of the retort house is not entirely protected from condensation, so that by the time it reaches the retort it is rather damp for fuel purposes. As the benches get older the heats usually are lower and the carbon burns more slowly. After the retorts have been burned out a number of times it take much more burning to make the carbon separate from the retort. Just why this should be so I am not prepared to say. After the pores of the retort have become filled up with carbon the deposited carbon seems to adhere much more firmly to the walls of the retort.

During the past summer the burning out process was taking too much time, so some scheme was sought to hurry up matters. At one time a supply of compressed air was available and this was connected to the steam piping and used in the same way as the steam. This gave very good results, in fact better than when the air was blown directly onto the carbon in the retort without any outside air drawn in with it. But a supply of compressed air is not always on tap, so some other device had to be found. At the present time superheated steam is being used with very satisfactory results. The superheating arrangement is simplicity itself. Where the steam pipe drops down in front of the bench a loop is passed through the sight-hole into the fire, so the steam, before reaching the retort, has to pass through several feet of red-hot pipe, and is consequently pretty dry. If an outlet is provided so that steam is kept on the loop while it is shut off from the retort, there is no trouble with the pipe burning out unduly.

With this arrangement we have been able to burn out retorts in a reasonable time that would have been almost impossible to burn out in the ordinary manner.

*Discussion.*

The President—Mr. Gifford's communication strikes me as rather an interesting "wrinkle." Perhaps some of the members could give us others as interesting bearing on this point.

Mr. Allyn—What does Mr. Gifford consider a reasonable time.

Mr. Gifford—An hour is the shortest, I believe, we got down to with this arrangement. I have known of other cases that took over a week.

Mr. Allyn—My first experience in gas making was in Dorchester, Mass. I think there we never did anything to remove the carbon, simply letting it accumulate until we had to remove the retort. My next experience was in Brookline, Mass., where we ran a pipe through the retort from front to back, passing a jet of steam into the pipe, which after a time loosened the carbon so that it could be removed. But the longer we followed this process the better we were convinced that it damaged the retorts altogether too much, so we gave up the use of steam and used air instead. We drilled a 3-inch hole in the lids and extended a fireclay pipe to the rear of the retort, took the stopper off the top of the standpipes, and removed the carbon in that way. We still believed that it was rather destructive to the retort, and finally went back to the first principle of simply removing the lid, taking off the plug at the top of the standpipe, and let the carbon loosen from the surface of the retort. That process we are following to-day, and it is the most successful and simple, and we believe the least injurious to the retorts, of any other plan that we tried. As a general thing we remove all the carbon in 12 hours. Occasionally, in the retorts in which we inject the oil, the carbon seems to form of great density. We sometimes are obliged to leave these retorts open for 24 hours; but in the ordinary retorts where no oil is used 12 hours will usually suffice to clean them out. We find not nearly as many cracks and holes in the retorts as formerly or when using steam or air through the pipes.

The President—Mr. Sherman, I believe you use compressed air?

Mr. Sherman—I used all the processes that I ever heard of, but at the present time am using compressed air. I used steam very successfully and liked it, but we can remove the carbon in about four hours with compressed air with less injury to the retorts than with any other process. Of course, it is a very great drain on the results obtained in a retort to allow the carbon to gather in it. It is easy enough for anybody to figure how many square feet of floor space are in a retort, and the allowing therein of a deposit that curtails its capacity 25 or 30 per cent. is poor economy. Small works of course cannot use compressed air, for it would not pay them to fit up the apparatus to do it, but all works have steam and that can be used very successfully for the removal of carbonaceous deposits.

Mr. Gifford—Has Mr. Allyn tried that process in small retorts? Our retorts, I presume, are much smaller in diameter than his, and it is my impression that it would take 365 days in the year to remove the carbon in our retorts by his method.

Mr. Allyn—One item I omitted to state was this: After I went to Cambridge I looked over the plant and found, on the marsh at the rear of the old works near the Mt. Auburn Cemetery—which seemed to be an appropriate place to leave it—a heap of about 40 tons of carbon, each lump representing the whole curve of the retort, and about 5 feet long. It seems their custom had been to run the retorts until the carbon was within about 3 feet of the front end; then they considered the thing was finished. The retorts were then broken and the carbon thrown out on the marsh. However, I got $5 a ton for that 40 tons of carbon. In answer to the gentleman in regard to the size of the retorts, we have been using only large retorts for the last 15 or 18 years, so that I never tried this method with small ones.

The President—I presume Mr. Gifford regrets his works are in such an overcrowded condition that he cannot place a small retort at the service of Mr. Allyn.

On motion of Mr. Allyn, a vote of thanks was tendered to Mr. Gifford.

[To be Continued.]

## Address of the President (Mr. C. H. Raynor, Adrian, Mich.), on the Occasion of the Sixth Annual Meeting of the Michigan Gas Association.

Gentlemen of the Michigan Gas Association: I welcome you to our sixth annual meeting. Those of you who were fortunate enough to be present will recall with pleasure our last meeting at Port Huron, with its interchange of thought on mutual problems, the fresh lights cast on different points of our business, from the varied standpoints and experiences of our numerous members, and last, but not least, the informal discussions among small groups between sessions.

To you as American citizens and true patriots, I need not speak at length of that disaster which has burned into your minds, that same date as the one on which occurred the insult to our flag and the sacrifice of many brave men. Days and weeks and months have followed since then, each one for a time more momentous in its issues to our government and private enterprises. You will recall the almost complete stagnation of business and the general outlook at the time of the declaration of war, but you will also recall that at each fresh obstacle to be surmounted a man equal to the emergency came forth from the ranks to not only overcome the obstacle, but to grasp his opportunity. With these heroes at the important posts, strengthened by hundreds of thousands of loyal hearts and willing hands, we have fought successfully a battle for the weak against the strong. With this victory has come also a change in the business outlook.

To impartial observers (to which class, being gas men, we of course belong), all signs point to a period of unusual growth and prosperity. Being practical men, we are here to-day to learn, through mutual converse and plain discussion, how in our turn to grasp our opportunity, and by up-to-date methods seek not only to benefit our several companies and ourselves financially, but also to give to our consumers increased accommodation and satisfaction. That the papers that are to be presented here to-day and the discussions of the same will tend toward that end you know from past meetings.

Allow me, therefore, to speak only in a general way of some points pertaining to the progress of our industry; for I fully realize that but little remains to be said on any point, after reading the various journals which handle the branches of our business in so thorough and practical a manner.

The "Progressive Age" states that reports show that great changes have taken place in the personnel ownerships, process and price of gas. They also indicate a remarkable growth in the incandescent gas lighting industry. Gas works in general show a decreased price for gas, an increased use for fuel, increased output and more c nsumers, especially where they have become better managed.

With the progress of events and new methods in all business, changes have also come to the gas business. Foremost among these is the change from being strictly illuminating companies to light, heat and power companies. In the larger cities and towns this is most noticeable; but from recent statistics it appears that with all companies the proportion of gas used for other than illuminating purposes is rap

idly increasing. I wish by no means to convey the idea that I think our career as lighting companies is declining. On the other hand, the time is clese at hand when we shall have opportunities to return to street lighting; gas through the incandescent burner rapidly proving itself the superior of other methods of street lighting.

In incandescent lighting there have been many discoveries in rare earth elements, and in improved methods in the manufacture of mantles, anti-vibrators, etc., that will tend to broaden results in that special field.

One of the remarkable developments of the past year is the extended use of acetylene gas. Hitherto the cost of the carbide has restricted its use almost to laboratory work. It is now claimed that carbide can be produced in such quantity at low cost as to permit its practical use. Though the generators are as yet not perfect, they have at least had the practical value of familiarizing the public with this system of lighting. While perhaps it has hardly been long enough, or under sufficiently varied conditions, subjected to practical uses to have thoroughly tested its value, it seems to me to be but one more efficient agency in the education of the masses to the general usefulness of gas. It has also been suggested as a standard for photometric use.

A new factor that stands in a similar position to-day to the gas interests as that of water gas 25 years ago is the manufacture of gas by the coke oven or bye-product process. These companies, located at some convenient point, pipe and sell their gas product to the gas companies of surrounding towns. What future development along this line may come I cannot tell; but certainly, with the rapid development of our soft coal fields and the demand for clearer atmosphere in our cities, some problem may be solved in a different manner from that formerly anticipated. This matter of bye-products reminds me forcibly of our old companion, coal tar, that still remains as inscrutable as ever, with little prospect of improvement.

A slight glimmer of light may be thrown on the subject by the development of a process in which the inventor proposes to use tar as an enricher in a water gas process. Some of our modern engineers should be able to predict the outcome of this experiment. To me it seems that the full value of coal tar has never yet been appreciated, or utilized.

Following the examples of past presidents of the Association, I made an attempt to show the results of Michigan's gas business for the past year, but, owing to incomplete returns, my report is scarcely as satisfactory a one as I hoped.

While these reports do not admit of making a correct average, 23 of the 24 companies reporting show a decided increase in output. While the report for 1897 showed an increase of about 70,000,000, the past year will show something over 100,000,000 increased output; about 60 per cent. of the sales being for light, at an average of $1.37 per 1,000; and 40 per cent. for fuel, at an average of $1.15 per 1,000. Many of our companies are sending out over 50 per cent. for fuel, and one of them shows as high as 67 per cent. One company increased its business 33 per cent., almost entirely through its fuel department.

The increased magnitude of modern engineering will not allow me to pass unmentioned that branch of our own business. Perhaps no better example is at hand than that shown in the failure of the immense tank and holder so recently constructed in New York city. The fact that a piece of work devised by our most skillful engineers has, from some unknown cause, proven a total failure, does not by any means invalidate our statement as the great progress made in gas engineering. Results rather point to the necessity existing for more scrupulous care as to contracts accepted, rather than to following what seems unfortunately to be rapidly becoming a habit with some of our industrial companies, viz., an acceptance of contractors' bids from the standpoint almost completely of cheapness, rather than the reliability of material and construction.

I wish to speak briefly of the great necessity existing for technical education among our younger gas men. So well is this necessity recognized among them that many of our profession, forced to take up this work practically at first, have, as soon as opportunities presented, realized that they were handicapped from lack of technical knowledge and have devoted a portion or all of their time for a season to obtaining that knowledge. This point was fully discussed in the American Gas Light Association meeting at Niagara last year, and best methods devised for putting such technical study within reach of even those who from environment must go on with their daily work. Practical results, as you already probably know, have followed in the raising of funds for carrying on such technical study by correspondence, and the employment of experts to conduct such work. Realizing the great advancement constantly made in the engineering world at large, it behooves us, gentlemen, to lay hold of every progressive movement to keep our special branch up to the standard. We, the older members of our profession, can recall many times when we have felt intensely our lack of technical power, and while natural fitness, perseverance, and common sense go a long ways, a good preparation and brain training are powerful weapons and time savers. Capital and labor must be the wheel horses, though they may not always pull together; but with enterprise and brain for the leaders success must come.

That the best field for future increase is among the masses, is self-evident. If the man with the very limited income can use gas for light and fuel economically, and we know that he can, it will require but little effort on our part to reach those in better circumstances. It has been proven that a loaf of bread can be baked with one cubic foot of gas, under certain conditions—that is, 100 loaves can be baked with 100 cubic feet of gas in a newly-invented gas heated oven—going far toward proving gas to be a valuable factor in household economics.

I deeply regret that it is my painful duty to announce to you the death of one of our members—William A. Coombs, President of the Coldwater (Mich.) Gas Company, who was also President of the National Millers' Association. He died June 19th, 1898. Mr. Coombs, while comparatively new to the gas business, and also as a member of our Association, was a man we could not well afford to lose, he being, from my personal knowledge, deeply interested in the progress and success of our Association.

In closing my address I wish to express my personal appreciation of the efficient services rendered to our Association, and the courtesy to myself, by Mr. Hyde, our Secretary. I certainly realize to how great an extent the success of our meetings is dependent on his executive ability and untiring efforts. Gentlemen, I leave the outcome of this meeting in your hands, stating it to be my conviction that only through the active participation of individual members in discussions and personal responsibilities felt can we achieve satisfactory results.

## The Coking, in Beehive Ovens, of the Coals of the New River District, West Virginia.

In a paper on this subject, read by Mr. Charles Catlett, of Staunton, Va., at the recent meeting of the American Association of Mining Engineers, said:

The New River District comprises the mines working on the coals of No. XII. or the Conglomerate Series of the Rogers Brothers, which are located on New River and its tributaries, and which find an outlet for their product east and west over the Chesapeake & Ohio Railway. The New River and Pocahontas coals are very similar in chemical composition. The differences which exist are apparently all in favor of the former, the coal, as a rule, carrying less ash, less sulphur, and slightly more volatile matter. In the matter of ash, the clean coal is remarkably pure; the writer having examined numerous picked samples which carried less than 1 per cent. in ash. Mendenhall and Campbell report a number of analyses of what is known as the Sewell seam, the average of which is: Moisture, 0 73; volatile matter, 26.43; fixed carbon, 70.04; ash, 2.46; sulphur, 0.56.

The coke of the district is made from slack coal, which naturally carries an undue proportion of impurities; but, in spite of this, the coke will usually run only about 6 per cent. in ash. A shipment of coke made during 1898 by the New River Coke Company for special purposes, and from slack coal which had been screened to separate slate, etc., showed 4.23 per cent. ash. The coal from which this coke was made must, therefore, have carried about 3 per cent. of ash. This is sufficient to give an idea of the character of the coal in this particular. The material entering into the manufacture of coke will usually carry a larger amount of ash than this special shipment; but in all cases the coal makes a coke of special value for shipment to considerable distances, where the freight on even 1 per cent. of ash amounts to a good deal. The sulphur, while variable, is usually quite low, running from 0.50 to 0.60 per cent., but often less.

Owing to the fact that the coke from this coal has been used to a very limited extent for the manufacture of Bessemer steel, little attention has been paid to the phosphor-contents, and but few analyses have been made. Those which have been made show an exceptionally small amount of that element. A coal of the average composition would theoretically furnish about 75 per cent. of coke. As a matter of fact, the majority of the ovens in the district do not yield 60 per cent., and many of them run less than 55 per cent.

The ovens of the New River Coke Company, which are bank-ovens, were built in 1888; and, while some of them have suffered from landslides, they may be considered, as a whole, to be in good condition;

they are not, however, in the best condition with reference to the retention of heat and the perfect regulation of the admission of air, so that a maximum yield cannot be expected.

Most of the ovens are 12 ft. in diameter and 6.5 ft. high on the inside. They are 30 in. high to the spring of the arch. The doors are 2 ft. 5.5 in. wide and 2 ft. 3.5 in. high to the spring of the arch, which is 5 in. high, making a total height of 2 ft. 8.5 in. Some of the doors are 1.5 in. higher. All the ovens are provided with draft-boxes, located on either side of the door, and slightly deflected where they enter the oven, so as to be at right angles to the axis on which the oven is constructed. Where these draft-boxes enter the oven, they intersect an arc of about 50 degrees. The inlet is 6 in. wide by 5 in. high, and is closed with a sliding lid. Where the draft enters the oven the hole is 4 in. high by 7 in. wide, and the bottom of the opening is 4 ft. from the floor of the oven. In process of time these boxes have got into bad condition, being sunken, so as to deliver the draft against the coke, or closed up, etc.

A large number of observations were made of the burning of a set of eight ovens by means of the draft boxes extending over a period of about two weeks. The results are given in detail in a series of tables accompanying the report. At the time of the observations the ovens were working on 72-hour and 96 hour coke. The charges for 72-hour coke averaged 10,640 lbs., and for 96-hour coke 11,312 lbs. All coal was accurately weighed. The ovens were afflicted with cold bottoms, which had a tendency to become wet from only a small amount of rain. They were exceptionally difficult to burn out so as to give clean bottoms over the entire oven. "Black ends" do not mean unburnt coal, but dark colored coke for a distance of 0.5 to 1 inch from the bottom.

The figures given in these tables are by no means conclusive on any point; but they show what a small amount of air is at times necessary to burn out the oven in the proper time; and they have been productive of much good in directing attention to the excessive draft which had formerly been used, and have also served to call attention to the necessity of protecting the ovens from small leakages, and to emphasize the fact that every pound of air going into the ovens unnecessarily is a source of loss. They have also served as a basis for other investi gations, of which circumstances did not permit a record, and have been, it is believed, instrumental in effecting an increase in the average yield for the year of 4 per cent. more than the ovens had ever produced before.

Some tests were also made with reference to the size of the ring, which was originally very large, and which in many cases had been worn even larger. The serious loss of heat from this source does not seem to have been fully recognized. Rings of various sizes were experimented with, the smallest being about 11 inches in diameter. The results with this size were quite good, but the general indications were that it was a little too small; and 12 inches is believed to be about the right size for this coal and these ovens.

## ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

A CORRESPONDENT in Oakland, Cal., writing under date of February 18th, says: "I inclose you herewith a clipping from the San Francisco *Chronicle*, showing the proposed plan of the Equitable works in Oakland. It makes a very pretty picture; and the promises they make, under color of an article, read like one of the tales of Aladdin. You have your blizzards in New York, while we have a superabundance of weather in California, but are not happy, because of the attacks of such creatures as these. The Equitable Company, of San Francisco, has been selling gas for a month, but has not increased its sales materially; and on no part of its lines has it placed a meter. No doubt there will be strenuous efforts made over there to maintain the plant, even at a considerable loss, so as to afford its promoters an opportunity of floating their stock for the Oakland enterprise, and also for other cities in the State. The financiers of the Eastern States may laugh at those of California for their readiness to part with something for nothing, as evidenced by the fact that although the backers of the Equitable Company, of San Francisco, have invested about $200,000 in plant and street mains, they had no difficulty in selling their stock at a valuation equiv lent to nearly $3,000,000. The same game will be played on this side of the Bay. A 'possible' $150,000 invested will yield to the promoters through a gullible public two or three millions in profit. Santa Cruz, California, is discussing the proposition of putting in a water gas plant, the long distance electric transmission of that city not proving the success it was hoped. This gives an added advantage to the gas manufacturer. Our Legislature, now in session, has before it a number of 'cinch' bills, all aimed at lighting companies. The quarrel between the companies at Sacramento and Fresno, between long distance transmission and gas, is still on, with the odds in favor of the Gas Company's winning out in the end. The two Companies in San Jose are engaged in a heavy war, cutting rates. The new Company is in the gas field now, and so meets its competitor, the old Company, on both grounds."

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MR. MASTIN SIMPSON, formerly with the Kansas City, Missouri, Gas Company, has been named to take charge of the distribution system of the Essex and Hudson Gas Company, of Newark, N. J.

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MR. H. D. WHITCOMB, JR., has been appointed to succeed Mr. J. A. P. Crisfield in the management of the works of the Mutual Gas Light Company, of Savannah, Ga.

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THE proprietors of the Corning (N. Y.) Gas Company are not enthusiastic believers just now in the serviceability of fiber pipe as a safe gas conveyor, one or more breaks in the fiber mains crossing the Fifth Ward bridge having caused large losses through leakage.

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THE inspection of the Everett plant of the New England Gas and Coke Company, by the members of the New England Association, on the adjournment of the latter's 29th annual meeting, was quite thorough. The party which numbered 125, arrived at the works shortly after noon on the 17th ult., where they were received by Messrs. L. J. Hirt (Chief Engineer), Fred. Tudor, Jr., C. H. Finn (Gen. Manager), Emil Wagner and Dr. Schniewind (Chemist), on behalf of the Gas and Coke Company. A hot luncheon having been diposed of, the visitors were escorted over the works, which certainly are on a mammoth scale.

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MR. EUGENE W. CRAWFORD has been appointed Superintendent of the Waterville (Me.) Gas and Electric Company.

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CHANCELLOR NICHOLSON, at Wilmington, Del., on the 24th ult., heard argument on the motion of the City of Wilmington to discontinue the injunction case filed by the city against the Oxy-Hydrogen Gas Company, of Wilmington, of which concern J. Edward Addicks is President. The city first secured a temporary injunction against the Company, restraining it from laying pipes in the streets. This case has been pending for 10 years, and recently the city moved that the case be discontinued, on the ground that the charter of the Gas Company having expired, it consequently had no standing in Court. Messrs. C. Berkley Taylor, of Philadelphia, and H. H. Ward, of Wilmington, represented the Gas Company, and Mr. Arthur W. Spruance appeared for the city of Wilmington. Chancellor Nicholson reserved his decision.

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THE United States Gas Consumers' Company, to deal in all kinds of apparatus for the manufacture or transmission of gas, oil or electricity, has been incorporated, at Trenton, N. J., with a capital of $100,000. The incorporators are Samuel Chittick, Henry G. Balton and Charles E. Chittick, all of New York.

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A SHORT time ago we reported in detail the application of the proprietors of the Ottumwa (Iowa) Gas Light, Heat and Power Company to the City Council for an amended and extended franchise. The Council has assented to the petition, and the franchise will be submitted to the voters for their acceptance or rejection at the coming municipal election.

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IN response to a bill in equity, filed by the Spencer (Mass.) National Bank against the Spencer Gas Company, the latter has been put in the hands of a receiver. The decree was made by Judge Gaskill, while presiding at the last long term of the Superior Civil Court, in Worcester. The receiver named was Mr. Rufus B. Dodge, Jr., Mayor of Worcester, whose bond was fixed in the sum of $100,000.

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MR. WILLIAM L. WALKER has been appointed to take charge of the gas stove department of the Fitchburg (Mass.) Gas and Electric Light Company.

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MR. N. W. BEATLEY and others have applied to the authorities of Calumet, Mich., for the right to construct and operate a gas works in the place named. Calumet is a post village of Houghton County, Michigan, and is the center of mammoth copper mining interests. Its population is not less than 6,500, and it constantly grows in wealth and importance.

THE proprietors of the Englewood (N.J.) Gas and Electric Company, who are also the owners of the Hackensack (N. J.) Gas and Electric Company, have, as an earnest of their way of dealing with the public, announced that hereafter all gas used will be billed at $2 per 1,000 cubic feet, prompt payment (within 15 days) to entitle the consumer to a rebate of 20 cents per 1,000. Mr. Poor and his associates in the Companies named propose to make radical improvements in the gas supply of the Englewood district, especially in the instance of main extensions. And the ultimate likelihood is that the Hackensack plant will furnish all the gas required, a holder station being maintained on the site of the old Englewood works.

THE following is the text of the Carrington amended ordinance which it is proposed to enact for the supervision of the gas supply of Memphis, Tenn.:

Section 1. Be it ordained by the legislative council of the city of Memphis, that the ordinance passed October 29, 1895, regulating the price of gas and establishing the office of gas inspector, be and the same is hereby so amended as to provide as follows:

Sec. 2. It shall be the further duty of the said inspector to see that all street lamps, in respect of illuminating power, come up to the specifications as per conditions of contract, and to make daily tests of same, keep register of pressure day and night and as to illuminating power, purity, etc.

Sec. 3. Be it further ordained, that it shall be the duty of said inspector to examine all complaints from gas consumers, and point out all defects, whether from meter or service pipes, or from the burners or inside construction of the building, and recommend the remedy, free of cost to consumer, except for meter inspection.

Sec. 4. It shall be the further duty of the said inspector to inspect all gas pipes put in new and old buildings, as to proper size, safe location and free from defects, and shall give certificates when found correct, free of cost to the builder or owner of said property.

Sec. 5. Said inspector shall have had not less than five years' experience as a gas engineer or gasfitter, who shall furnish the legislative council satisfactory evidence of his ability and qualifications before his election to said office.

Sec. 6. Be it further ordained, That it shall be the duty of the gas inspector, and he shall have power, to inspect all meters for the measurement of electricity used for power, and the said gas inspector shall be paid the same fee for the inspection of electric meters as provided for the inspection of gas meters, and the failure of any person, firm or corporation, to correct any fast electric meter, after notification by the gas inspector, shall render such person, firm or corporation, owning or putting in such electric meter, guilty of a misdemeanor, punishable upon conviction by a fine of not less than $1, nor more than $50, for each and every offense.

MR. B. F. BURT, Secretary of the Riverside (Cal.) Gas and Electric Light Company, has notified the shareholders that an assessment of 10 per cent. ($5 per share) has been levied on the capital stock. The delinquent time is named for the 20th inst., and the sale at public auction of delinquent shares will be held April 15th.

THE Oneida (N. Y.) Gas Light Company has brought suit against John Marsden for damages to its main system caused by defendant while constructing a sewer through William street.

THE controlling interest in the Wallingford (Conn.) Gas Light Company, hitherto held by Mrs. McLellan, of Springfield, Mass., has been purchased by Colonel William Barbour, President of the Barbour Linen Thread Company, Paterson, N. J.

AN inclosure from Sacramento, Cal., dated Feb. 22, says that Assemblyman Radcliffe is moving a bill in the California Legislature, which provides that the rates to be charged by any company or corporation doing business within any municipal corporation exceeding 50,000 inhabitants, for furnishing electric light, shall be as follows: First, for the electric light for each and every burner furnishing a 16-candle power light, not to exceed 50 cents per month; second, for each and every burner of greater candle power than 16-candle power, not to exceed 50 cents per month for each additional power of full 16 candles; third, for burners of less than 16-candle power of every description, not to exceed 20 cents for electric light so furnished per burner per month, and in no case where electric light is furnished for burners exceeding 16 candle power shall any additional rate be charged other than the fixed rate of 50 cents per light per month, unless the light for such burner thus furnished gives an additional light of full 16 candles. The use of meters or other appliances for the purpose of fixing rates for furnishing electric light is declared to be unlawful, and violation of any provision of the Act is made punishable by the payment by the company or corporation to the person or persons aggrieved the sum of $250 damages, together with all costs of suit and an attorney's fee of $50. This looks a strike with a vengeance.

IT is possible that the new plant for the Peekskill (N. Y.) Gas Light Company will be located on Travis Island, which would seem an ideal place for it.

THE Trenton (N. J.) *American* says that the articles of agreement and consolidation of the Trenton Light and Power Company, the Peoples Electric Light Company, the Edison Electric Light Company, the Trenton Electric Light and Power Company, the Trenton Gas Light Company, and the City Gas Light Company, of Trenton, were filed the last week in February. The amalgamated corporation is to be known as the Trenton Gas and Electric Company, and its capital stock is put at $2,000,000, which should be sufficient—at least for the present. The redistribution of the securities seems to have been accomplished in the following manner: The capital stock of the Trenton Light and Power Company, consisting of 7,326 shares, is converted into 1,452 shares of the new Company; the 1,400 shares of the Peoples Electric Light Company are converted into 2,800 shares of the new Company, to be divided pro rata amongst the owners of the stock of the Trenton Light and Power Company. The 1,000 shares of the Edison Electric Light and Power Company, owned the same way, are converted into 1,000 shares, divided in like way. The 600 shares of the Trenton Electric Light and Power Company (par value, $50) are converted into 600 shares of the new concern. The 748 shares of the City Gas Light C mpany, which shares are owned by the Trenton Gas Light Company, are converted into 948 shares of the new Company, and are divided pro rata amongst the original holders. The 17,914 shares (par value, $20) of the Trenton Gas Light Company are exchangeable for bonds of the new Company to the amount of $500,000, estimated at par, said bonds to be of the denomination of $1,000 each, and to bear 5 per cent. interest. Bonds to the amount of $250,000 are to be issued in payment of a like amount of indebtedness now owing to the Trenton Gas Light Company, and $750,000 in payment of a like amount of indebtedness of the Trenton Light and Power Company.

ONE or two more convulsive movements, in connection with the proposed construction of a gas works in East Liverpool, Ohio, are reported. Mr. J. W. Rigby has been elected Secretary of the concern, vice W. T. Tebbutt, and Mr. S. C. Williams was elected a Director. President Burford declares that a site for the work has been purchased, and that the plant will be in going order within six months.

THE proprietors of the Perth Amboy (N. J.) Gas Light Company have announced that, on and after April 1st, the discount for prompt payment will rule at 20 cents (instead of 10 cents) per 1,000 cubic feet.

THE consolidation of the lighting interests of Paterson and Passaic, N. J., has been virtually accomplished. The United Gas Improvement Company controls the situation.

MR. JOSEPH KRUMHOLZ, Secretary of the Buffalo (N. Y.) Gas Company, under date of the 21st ult., made the following announcement: "You are hereby notified that from and after the next reading of your meter, for the February gas consumption, the price of gas to your premises will be $1.20 per 1,000 cubic feet, with a rebate of 20 cents per 1,000 cubic feet if the bills are paid at our office on or before the 10th day of each month."

A CORRESPONDENT in Sacramento, Cal., forwards the following: A bill is now before the California Legislature which provides that no individual, firm or corporation furnishing gas shall require any deposit from the owner of any building in which and for whom a meter is furnished, but upon the request of a tenant or lessee of a building or room such individual, firm or corporation may demand and collect a deposit not to exceed $2.50 in cases where such building or room contains 10 or less burners, and a deposit of $5 in cases where the number of burners exceeds 10. This money is to be placed to the consumer's credit, and the meter is not to be removed or the gas shut off while there remains a balance to his credit. Every consumer shall be allowed to apply on the house side of the meter any device for saving, regulating or measuring the gas, he to assume any expense of damage that may result. Section 3 of the bill says that "the Board of Trustees, City Council or other governing body of any city, city and county or town may in its discretion change and regulate the price of gas and provide for the inspection of the meters furnished consumers."

## The Market for Gas Securities.

The city gas share market was fairly strong and measuredly active during the week. Consolidated opened to-day (Friday) at 216¼, ex dividend of 2 per cent., payable March 15th. There was some progress made over the bill to incorporate the Astoria Light, Heat and Power Company, the advocates of the same agreeing to submit to any reasonable amendment thereof. Meanwhile, it is well to remember that the measure is not a vital one in the matter of eventual consolidation. Mutual is 319 to 325; New Amsterdam common is 38 to 39½; Standard common is 135 to 138. We have no hesitation in advising the purchase of any city gas shares at current prices.

Brooklyn Union is a trifle easier, the quotation at the opening to day being 152 to 154. Bay State, supposedly on the refusal of the Stock Exchange to permit dealings in the last capital issue of $50,000,000, broke sharply. The opening to-day was 4½ to 4¼. Peoples gas, of Chicago, is 112, ex dividend.

## Gas Stocks.

**Quotations by George W. Close, Broker and Dealer in Gas Stocks.**

16 Wall Street, New York City.

March 6.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

| *N. Y. City Companies.* | *Capital.* | *Par.* | *Bid.* | *Asked.* |
|---|---|---|---|---|
| Consolidated | $39,078,000 | 100 | 216¾ ex div | |
| Central Union, Bonds, 5's | 3,000,000 | 1,000 | 107½ | 108½ |
| Equitable Bonds, 6's | 1,000,000 | 1,000 | 105 | .. |
| " 1st Con. 5's | 2,300,000 | 1,000 | 114 | . |
| Metropolitan Bonds | 658,000 | . | 108 | 112 |
| Mutual | 3,500,000 | 100 | 319 | 325 |
| " Bonds | 1,500,000 | 1,000 | 100 | 102 |
| Municipal Bonds | 750,000 | . | .. | . |
| New Amsterdam Gas Co. | 13,000,000 | 100 | 38 | 39½ |
| Preferred | 10,000,000 | 100 | 68 | 69 |
| Bonds, 5's | 11,000,000 | 1,000 | 103¼ | 104 |
| Northern Union, Bonds, 5's | 1,250,000 | 1,000 | 94½ | 95½ |
| New York and East River.. | | | | |
| Bonds 1st 5's | 3,500,000 | 1,000 | 111 | 113 |
| " 1st Con. 5's | 1,500,000 | .. | 107½ | 108½ |
| Richmond Co., S. I. | 348,650 | 50 | 70 | .. |
| " Bonds | 100,000 | 1,000 | .. | .. |
| Standard | 5,000,000 | 100 | 135 | 138 |
| Preferred | 5,000,000 | 100 | 150 | 155 |
| Bonds, 1st Mortgage, 5's | 1,500,000 | 1,000 | 112 | 114 |
| Yonkers | 299,65 | 500 | 130 | . |
| *Out-of-Town Companies.* | | | | |
| Brooklyn Union | 15,000,000 | 100 | 152 | 154 |
| " " Bonds (5's) | 15 000,000 | 1,000 | 118 | . |
| Bay State | 50,000,000 | 50 | 4½ | 4¾ |
| " Income Bonds | 2,000,000 | 1,000 | .. | 75 |
| Binghamton Gas Works | 450,000 | 100 | .. | .. |
| " 1st Mtg. 5's | 450,000 | 1,000 | .. | . |
| Boston United Gas Co.— | | | | |
| 1s Series S. F. Trust | 7,000,000 | 1,000 | 92 | .. |
| 2d " " " | 3,000,000 | 1,000 | .. | 80 |
| Buffalo City Gas Co. | 5,500,000 | 100 | 15½ | 16½ |
| " " Bonds, 5's | 5,250,000 | 1,000 | 93 | 93½ |
| Central, San Francisco | 2,000,000 | .. | 105 | .. |
| Chicago Gas Co. Guaranteed Gold Bonds | 7,650,000 | 1,000 | 104 | 104¼ |
| Columbus | 1,144,700 | 100 | 70 | 75 |
| 1st Mortgage | 1,207,000 | 1,000 | 101 | 103½ |
| Consumers. Jersey City | 2,000,000 | 100 | 88 | .. |
| " Bonds | 600,000 | 1,000 | 104 | 106 |
| Cincinnati G. & C. Co. | 8,500,000 | 100 | 206½ | 208 |
| Consumers, Toronto | 1,700,000 | 50 | 230 | 235 |
| Capital, Sacramento | 500,000 | 50 | .. | 35 |
| Bonds (6's) | 150,000 | 1,000 | .. | .. |
| Consolidated, Baltimore | 11,000,000 | 100 | 69 | 69½ |
| Mortgage, 6's | 3,600,000 | .. | 107 | 107½ |
| Chesapeake, 1st 6's | 1,000,000 | .. | .. | .. |
| Equitable, 1st 6's | 910,000 | .. | .. | .. |
| Consolidated, 1st 5's | 1,490 000 | .. | .. | .. |
| Consolidated Gas Co. of N.J. | 1,000,000 | 100 | 15 | 17 |
| " Con. Mtg. 5's | 380,000 | 1,000 | 80 | 82 |
| Consolidated G. & E. Co.'s., Little Falls, N.Y. | 90,000 | 100 | .. | 100 |
| Bonds | 75,000 | .. | .. | 100 |
| Detroit City Gas Co. | 4,560,000 | 50 | 65 | 65½ |
| " Prior Lien 5's | 4,546,000 | 1,000 | 94¼ | 94½ |
| Detroit Gas Co., 5's | 423,000 | 1,000 | 95½ | 96 |
| " Inc. 5's | 31,000 | 100 | . | .. |
| quitable Gas & Fuel Co., Chicago, Bonds | 2,000,000 | 1,000 | .. | 101 |
| Fort Wayne | 2,000,000 | .. | 68 | 70 |
| " Bonds | 2,000,000 | .. | 80 | 82 |
| Grand Rapids Gas Lt. Co. | 1,000,000 | 50 | .. | .. |
| " 1st Mtg. 5's | 1,125,000 | 1,000 | .. | .. |
| Hartford | 750,000 | 25 | .. | 145 |
| Indianapolis | 2,000,000 | .. | 100 | 105 |
| " Bonds, 6's | 2 650,000 | .. | 105 | 106 |
| Jackson Gas Co | 250,000 | 50 | .. | .. |
| " 1st Mtg. 5's | 250,000 | 1,000 | .. | .. |
| Jersey City | 750,000 | 20 | 210 | .. |
| Lafayette Gas Co., Ind. | 1,000,000 | 100 | 68 | 70 |
| Bonds | 1,000,000 | 1,000 | 81 | 86 |
| Louisville | 2,570,000 | 50 | 106 | 108 |
| Laclede, St. Louis | 7,500,000 | 100 | 52 | 52¼ |
| Preferred | 2,500,000 | 100 | 97 | 100 |
| Bonds | 10,000,000 | 1,000 | 107½ | 108 |
| Madison Gas & Elec. Co. | 400,000 | 100 | .. | .. |
| " 1st Mtg. 6's | 350,000 | 1,000 | .. | .. |
| Montreal, Canada | 2,000,000 | 100 | 200 | .. |
| Newark, N. J., Gas Co. | 1,000,000 | .. | 200 | 220 |
| Bonds, 6's | 4,000,000 | .. | 128 | 130x |
| New Haven | 1,000,000 | 25 | 252 | .. |
| Nashville Gas Lt. Co. | 1,000,000 | 50 | 110 | .. |
| Oakland, Cal. | 2,000,000 | .. | 53½ | 55 |
| " Bonds | 750,000 | .. | .. | .. |
| Peoples G. L. & Coke Co., of Chicago | 25,000,000 | 100 | 111½ | 111¾ |
| Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage | 20,100,000 | 1,000 | 111½ | 112 |
| 2d " | 2,500,000 | 1,000 | 104 | 105 |
| Peoples, Jersey City | 500,000 | 50 | 240 | 250 |
| Rochester Gas & Elec. Co. | 2,150,000 | 50 | 52 | .. |
| Preferred | 2,150,000 | 50 | 105 | .. |
| Consolidated 5's | 2,000,000 | .. | 87½ | 90 |
| San Francisco, Cal. | 10,000,000 | 100 | 88½ | 89 |
| St. Paul Gas Light Co. | 1,500,000 | 100 | 50 | 52 |
| 1st Mortgage 6's | 650,000 | 1,000 | 82 | 85 |
| Extension, 6's | 600,000 | 1,000 | .. | .. |
| General Mortgage, 5's | 2,428,000 | 1,000 | 80 | 82 |
| St. Joseph Gas Co | 1,000,000 | 100 | .. | .. |
| " 1st Mtg. 5's | 750,000 | 1,000 | .. | .. |
| Syracuse, N. Y. | 1,750,000 | 100 | 18 | 20 |
| Bonds | 1,612 000 | 1,000 | 85 | 89 |
| Washington, D. C | 2,000,000 | 20 | 260 | 265 |
| First mortgage 6's | 600,000 | .. | .. | .. |
| Western, Milwaukee | 4,000,000 | 100 | 97 | 97¾ |
| Bonds, 5's | 3,880,500 | . | 106 | 108 |
| Wilmington, Del. | 550,000 | | 208 | .. |

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## For Response.

A French gentleman, for many years in the gas business, parts of which time were spent in the service of large gas companies in France, Germany and Austria, would like to correspond with the gas representatives of America. He represents the owners of several meritorious foreign inventions for the better use of gas, and also has for disposition good devices of his own. Is well posted respecting acetylene gas. Address L. BERNHEIM, care F. WEIL,
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|---|---|
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| Saltley Works, Birmingham, Eng. | 2,000,000 |
| Colchester, Eng. | 300,000 |
| Birkenhead, Eng. | 2,250,000 |
| Swindon (New Swindon Gas Co.), Eng. | 120,000 |
| Saltley Works, Birmingham, Eng. (2d Contract) | 2,000,000 |
| Windsor Street Works, Birmingham, Eng. (Second Contract), | 2,000,000 |
| Halifax, Eng. | 1,000,000 |
| Toronto, | 250,000 |
| Ottawa, | 250,000 |
| Toronto (Second Contract, Remodeled), | 2,000,000 |
| Lindsay (Remodeled), | 125,000 |
| Belleville, | 250,000 |
| Ottawa (Second Contract), | 250,000 |
| Brantford (Remodeled) | 200,000 |
| St. Catherine's (Remodeled), | 250,000 |
| Kingston, Pa. | 125,000 |
| Montreal, | 500,000 |
| Peterborough, Ont. | 250,000 |
| Wilkesbarre, Pa. | 750,000 |
| St. Catherine's (Second Contract), | 250,000 |
| Buffalo, N. Y. | 2,000,000 |
| Winnipeg, Man. | 500,000 |
| Colchester, Eng. (Second Contract), | 300,000 |
| York, Eng. | 750,000 |
| Rochester, Eng. | 500,000 |
| Kingston, Ont. | 300,000 |
| Crystal Palace District, Eng. | 2,000,000 |
| Duluth, Minn. | 300,000 |
| Caterham, Eng. | 150,000 |

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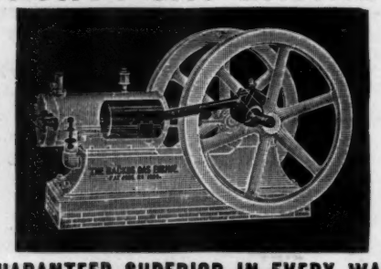

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For Cutting Cast, Wrought Iron, Gas & Water Pipes.

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GAS STEAM TABLES,
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BRAY BURNERS,
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GAS SIGNS,
SELF-LIGHTING BURNERS,
BY-PASSES,
GAS FITTINGS,
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SERVICE COCKS,
WAX TAPERS,
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GAS OVENS,
GAS PLATE WARMERS,
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GAS HEATING STOVES,
GAS FIRES,
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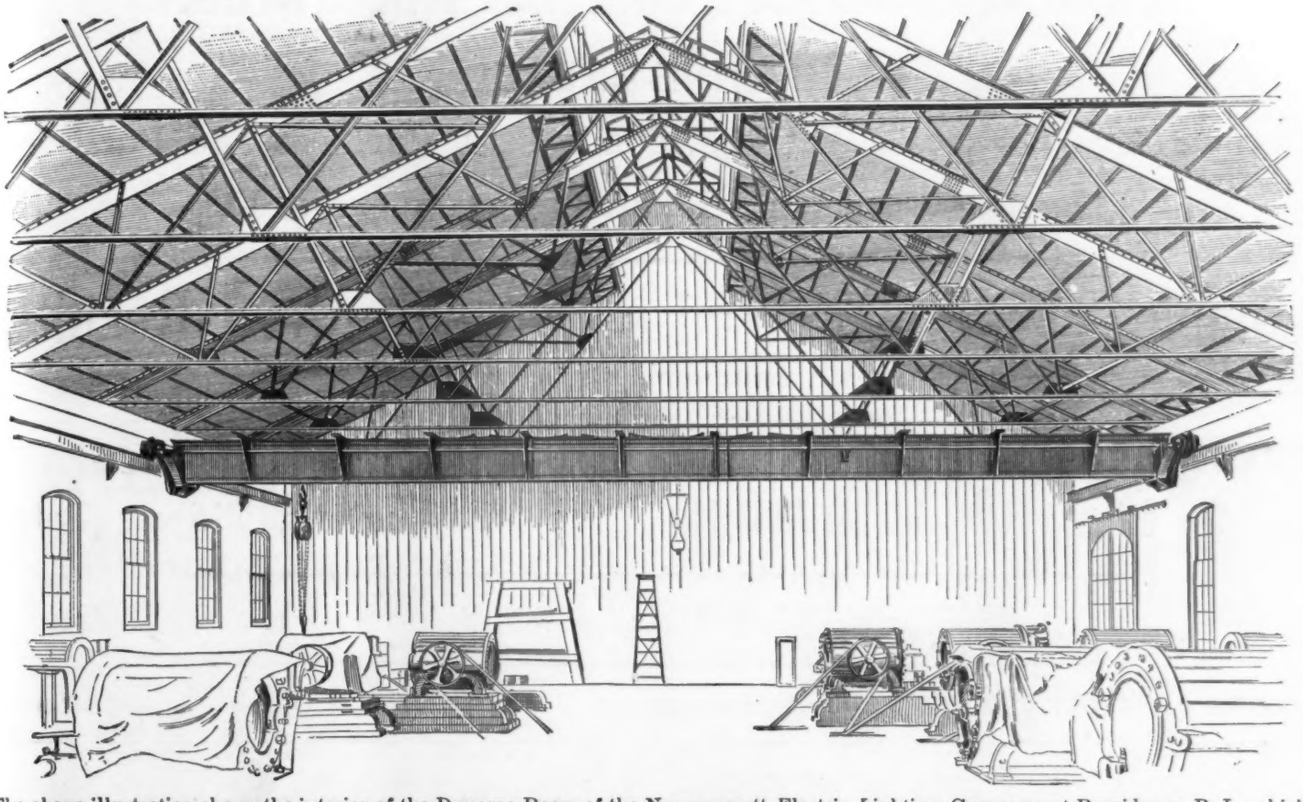

The above illustration shows the interior of the Dynamo Room of the Narragansett Electric Lighting Company, at Providence, R. I., which is 60 ft. in width and 200 ft. in length. The side walls are of brick, the roof trusses of iron covered with our Patent Anti-condensation Corrugated Iron Roof Covering. We have used this roof covering on a large number of buildings designed for Gas Works throughout the United States, and have no hesitation in guaranteeing that it will not drip moisture in cold weather.

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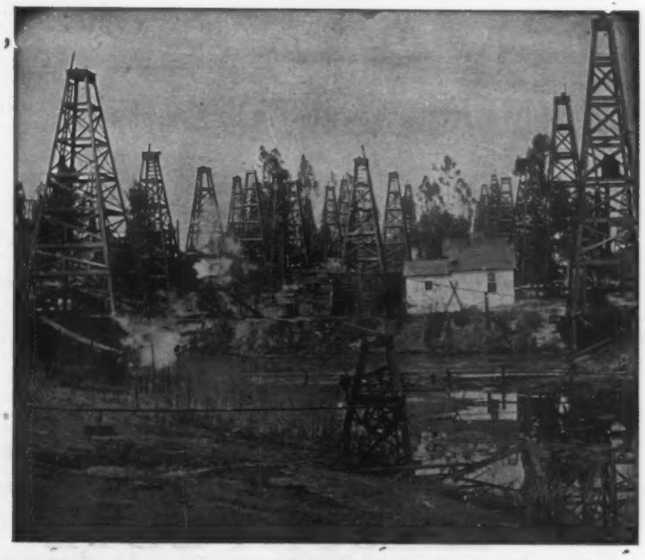
Nowhere else on this continent does such opportunity exist for profitable gas investment as on the Pacific Coast, since the perfection of the new LOWE Process for using the heavy crude California oils (of which there is an unlimited supply) without the use of any other fuels. Seven years' test proves the system to be perfect in every respect. Los Angeles alone, in addition to present street mains, has 150 miles of well built up streets without a gas main on them. To occupy this territory, and a large number of other towns now without gas, we have organized a parent company and a number of local companies covering some of the fastest growing cities in the United States.

Now is the time to invest, when the first capital will be able to double itself in a single year. This is also the most delightful residence section in the United States.

We suggest to those desiring gas investments, in large or moderate amounts—with or without active business connections—to come here and investigate; or, what is the next best thing, write us for particulars and prospectus.

The accompanying cut shows the oil wells in the suburbs of Los Angeles from which the Companies under the NEW LOWE GAS PROCESS obtain their supply of oil.



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Gas Enriching Plants to Enrich Coal Gas up to 24 Candle Power, and Making a White, Bright, Non-smoking Gas.

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MORE DIRECT IN ACTION. FEWER PARTS.
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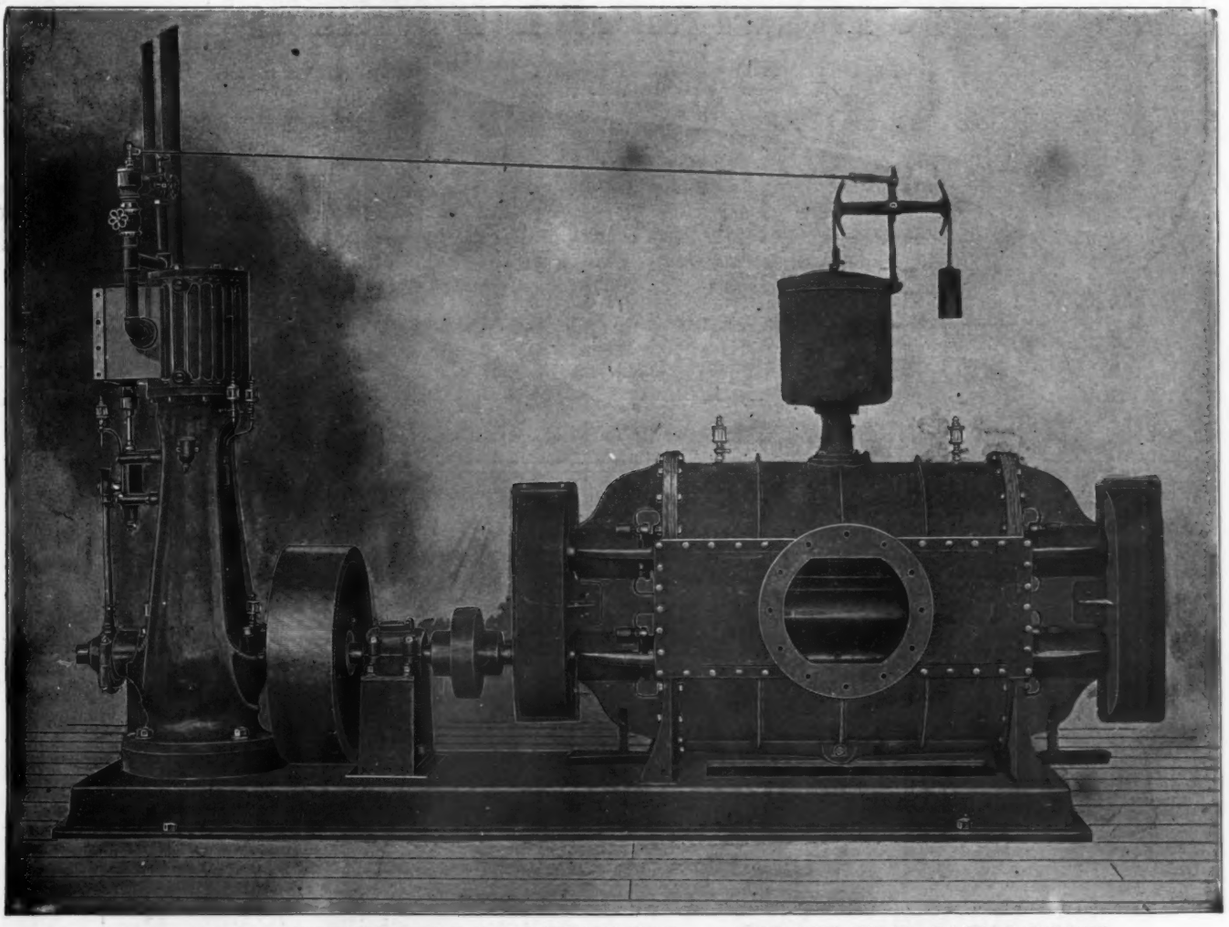

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## American Gas Company,

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STYLE No. 81.

Our PATENTED "STREET LIGHT APPLIANCES" have made WELSBACH STREET LIGHTING a complete success.

By the UNIFORM DISTRIBUTION of light on scientific principles a greater area can be lighted by our system and more economically than in any other way.

Where there are no gas mains already laid, we can furnish an equally good light by our **SELF-GENERATING NAPHTHA WELSBACH BURNER,** enabling Gas Companies to furnish a uniform light in all localities.

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CORRESPONDENCE SOLICITED FROM GAS COMPANIES AND OTHERS INTERESTED IN MUNICIPAL LIGHTING.

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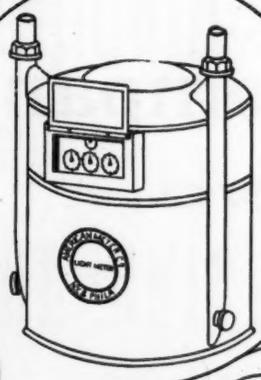

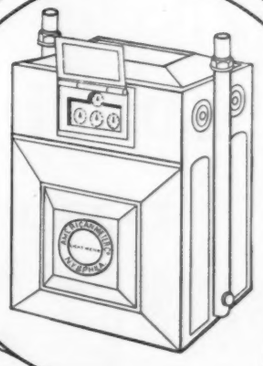

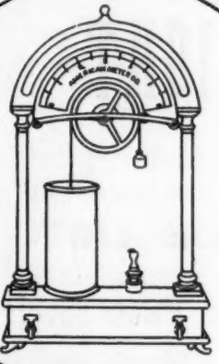

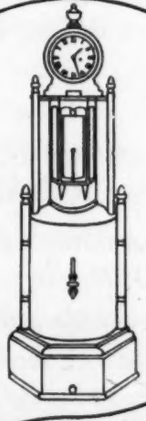

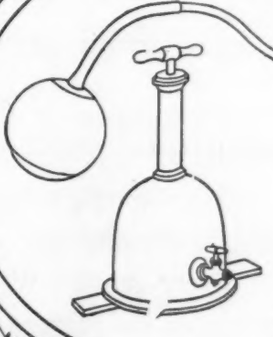

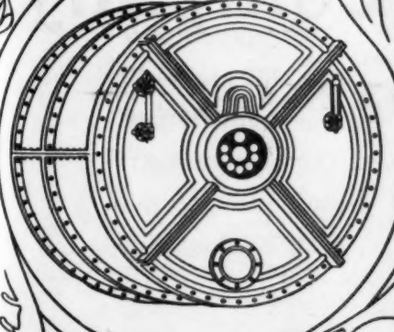

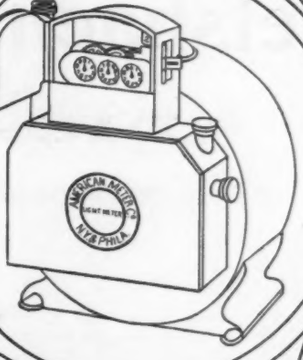

## PUBLIC LIGHTING TABLE.

### MARCH, 1899.

| Day of Week. | Date. | Table No. 1. FOLLOWING THE MOON. Light. | Extinguish. | Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Light. | Extinguish. |
|---|---|---|---|---|---|
| | | | | P.M. | A.M. |
| Wed. | 1 | 6.20 PM | 11.20 PM | 5.30 | 5.45 |
| Thu. | 2 | 6.20 | 12.30 AM | 5.30 | 5.45 |
| Fri. | 3 | 6.20 | 1.30 | 5.30 | 5.45 |
| Sat. | 4 | 6.20 LQ | 2.40 | 5.30 | 5.45 |
| Sun. | 5 | 6.30 | 3.30 | 5.40 | 5.35 |
| Mon. | 6 | 6.30 | 4.20 | 5.40 | 5.35 |
| Tue. | 7 | 6.30 | 5.10 | 5.40 | 5.35 |
| Wed. | 8 | 6.30 | 5.20 | 5.40 | 5.35 |
| Thu. | 9 | 6.30 | 5.20 | 5.40 | 5.35 |
| Fri. | 10 | 6.30 | 5.20 | 5.40 | 5.35 |
| Sat. | 11 | 6.30 NM | 5.20 | 5.40 | 5.35 |
| Sun. | 12 | 6.40 | 5.10 | 5.50 | 5.20 |
| Mon. | 13 | 6.40 | 5.10 | 5.50 | 5.20 |
| Tue. | 14 | 6.40 | 5.10 | 5.50 | 5.20 |
| Wed. | 15 | 6.40 | 5.10 | 5.50 | 5.20 |
| Thu. | 16 | 11.00 | 5.10 | 5.50 | 5.20 |
| Fri. | 17 | 11.50 | 5.10 | 5.50 | 5.20 |
| Sat. | 18 | 12.40 AM | 5.10 | 5.50 | 5.20 |
| Sun. | 19 | 1.20 | 5.00 | 6.00 | 5.10 |
| Mon. | 20 | 2.00 | 5.00 | 6.00 | 5.10 |
| Tue. | 21 | 2.30 | 5.00 | 6.00 | 5.10 |
| Wed. | 22 | 3.00 | 5.00 | 6.00 | 5.10 |
| Thu. | 23 | 3.20 | 5.00 | 6.00 | 5.10 |
| Fri. | 24 | 3.50 | 5.00 | 6.00 | 5.10 |
| Sat. | 25 | No L. | No L. | 6.00 | 5.10 |
| Sun. | 26 | No L. FM | No L. | 6.10 | 4.55 |
| Mon. | 27 | No L. | No L. | 6.10 | 4.55 |
| Tue. | 28 | 6.50 PM | 9.10 PM | 6.10 | 4.55 |
| Wed. | 29 | 6.50 | 10.20 | 6.10 | 4.55 |
| Thu. | 30 | 6.50 | 11.30 | 6.10 | 4.55 |
| Fri. | 31 | 6.50 | 12.30 AM | 6.10 | 4.55 |

### TOTAL HOURS LIGHTING DURING 1899.

| By Table No. 1. | Hrs. Min. | By Table No. 2. | Hrs. Min. |
|---|---|---|---|
| January | 215.40 | January | 423.20 |
| February | 184.40 | February | 355.25 |
| March | 187.40 | March | 355.35 |
| April | 166.50 | April | 298.50 |
| May | 158.00 | May | 264.50 |
| June | 140.50 | June | 234.25 |
| July | 150.30 | July | 243.45 |
| August | 168.30 | August | 280.25 |
| September | 179.50 | September | 321.15 |
| October | 213.20 | October | 374.30 |
| November | 217.00 | November | 401.40 |
| December | 238.10 | December | 433.45 |
| Total, yr. | 2221.00 | Total, yr. | 3987.45 |

# Welsbach Commercial Company,

## DREXEL BUILDING,

## PHILADELPHIA.

**WE NOW SELL**

# THE IMPROVED WELSBACH LIGHT

to all gas companies and first-class dealers in gas appliances.

**SEND FOR NEW CATALOGUE AND PRICE LIST.**

We are now prepared to furnish our New Combination Pilot Jet By-Pass and Adjustable Bunsen.

Our New Hot Wire Electric Igniter is a great improvement in electric gas lighting. Cannot short circuit. Send for prices and full information.

All imitations of the Welsbach light are infringements of the Welsbach patents, and the public is cautioned against purchasing such.

Suits brought by the Welsbach Light Company against manufacturers of infringing lights and mantles are still pending and undetermined.

Every genuine Welsbach lamp has the trade-mark, "Welsbach," conspicuously printed on the package and on the burner itself.


# Welsbach Commercial Company,

## DREXEL BUILDING,

## PHILADELPHIA.

# Standard Lowe Water Gas Apparatus

Constructed During 1898

BY

# THE UNITED GAS IMPROVEMENT COMPANY

## Philadelphia.

| PLACE. | SETS OF APPARATUS. | DIAMETER OF SHELLS. | |
|---|---|---|---|
| Cleveland, O. | 3 | 8 ft. 6 in. | |
| Portland, Me. | 1 | 7 ft. 6 in. | |
| Washington, D. C. | 4 | 8 ft. 6 in. | |
| Philadelphia, Pa. | 20 | 8 ft. 6 in. | |
| Norfolk, Va. | 1 | 7 ft. 6 in. | (Second Contract.) |
| Trenton, N. J. | 2 | 7 ft. 6 in. | |
| Flint, Mich. | 1 | 4 ft. | |
| Jenkintown, Pa. | 1 | 5 ft. | |
| Yonkers, N. Y. | 1 | 8 ft. 6 in. | |
| Paterson, N. J. | 1 | 8 ft. 6 in. | |
| Waterbury, Conn. | 1 | 8 ft. 6 in. | |
| Chicago (Ogden Gas Co.) | 1 | 8 ft. 6 in. | (Second Contract.) |
| LaFayette, Ind. | 1 | 5 ft. | (Second Contract.) |
| Lynn, Mass. | 1 | 7 ft. 6 in. | (Second Contract.) |
| Mt. Clemens, Mich. | 1 | 4 ft. | |
| New Brunswick, N. J. | 1 | 6 ft. | |
| Pittsfield, Mass. | 1 | 5 ft. | (Second Contract.) |
| New York (East River Co.) | 2 | 11 ft. | (Second Contract.) |
| Johnstown, N. Y. | 2 | 6 ft. | |
| Waukegan, Ill. | 1 | 5 ft. | |
| Chester, Pa. | 1 | 6 ft. | (Second Contract.) |
| Somerville, N. J. | 1 | 4 ft. | |
| Hackensack, N. J. | 1 | 6 ft. | (Second Contract.) |
| Torrington, Conn. | 2 | 5 ft. | |
| Glassport, Pa. | 2 | 5 ft. | |

Established 1858. Incorporated 1890.

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FIRE BRICK and FIRE CLAY SPECIALTIES

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FLEMMING GENERATOR GAS FURNACE

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Water Gas Cupola Linings, Fire Clay, Etc.

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This is the *original* coal-consuming Furnace for Retort Benches. Burns either Coal or Coke. Full and Half-Depth Regenerative Furnaces for Benches of 6's, 7's, 8's or 9's erected complete.

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AND EVERYTHING IN THE FIRE CLAY LINE.

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(ESTABLISHED 1856.)

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**Clay Gas Retorts,**

BENCH SETTINGS,

Fire Brick, Tiles, Etc.

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**GEROULD'S IMPROVED RETORT CEMENT**

A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

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In Kegs, 100 to 200 " " 6 " "
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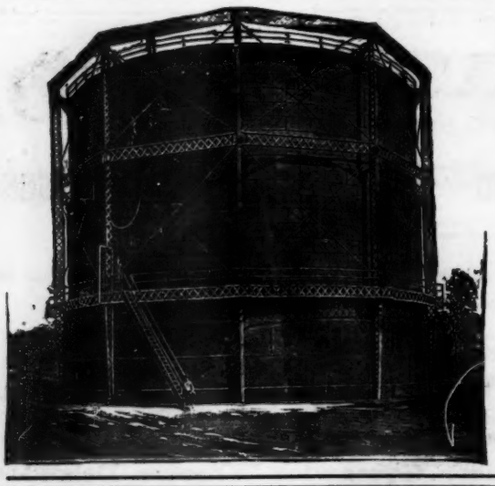

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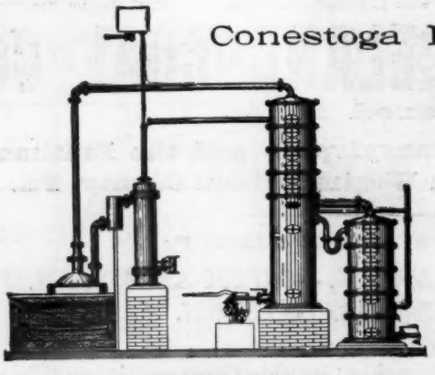

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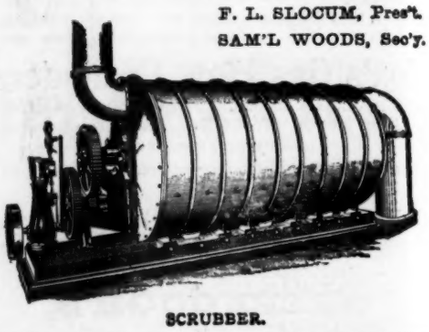

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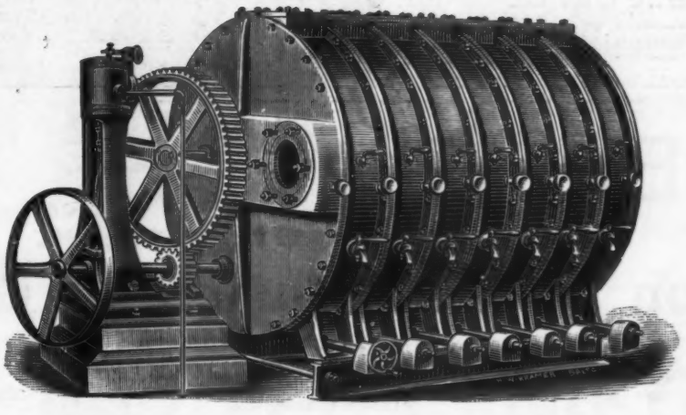

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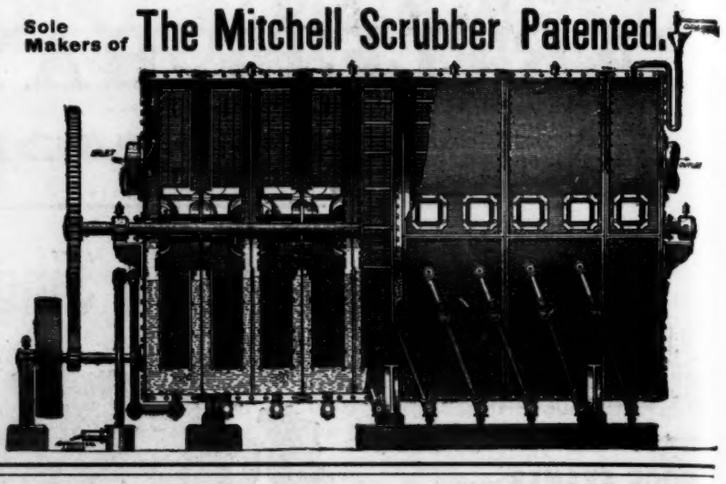

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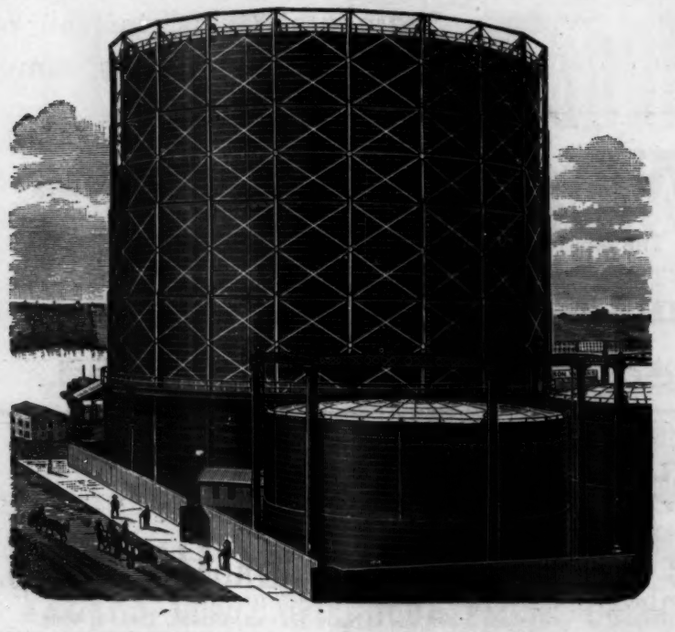

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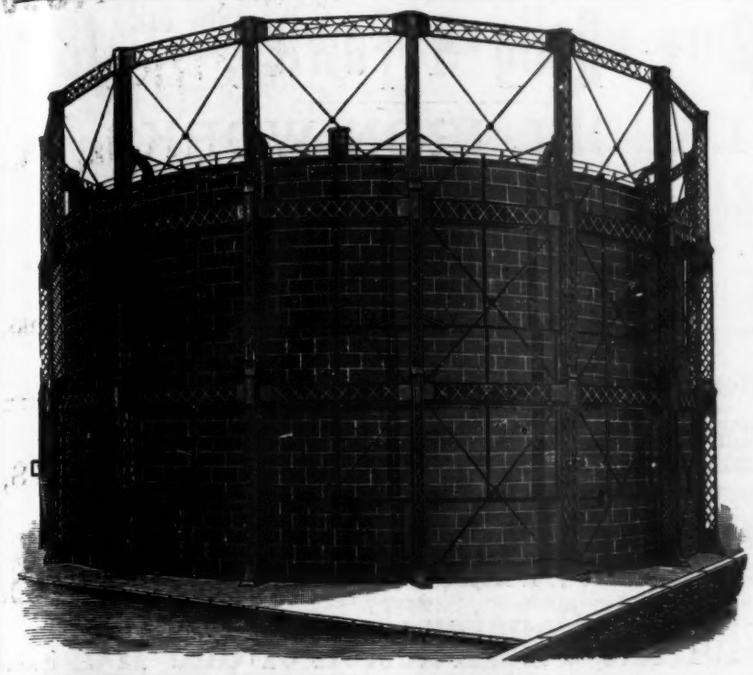

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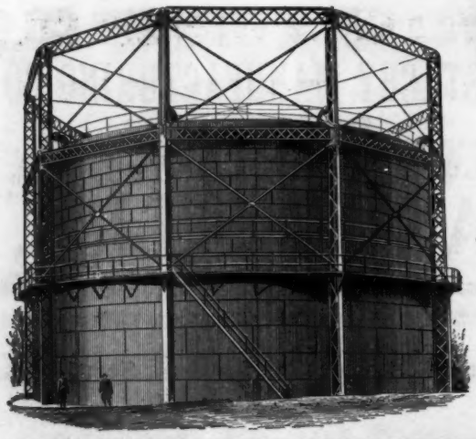

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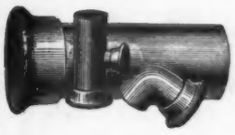

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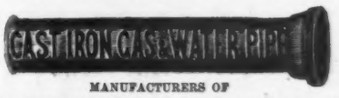


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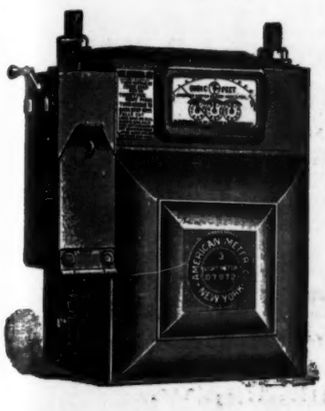

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All Parts Interchangeable

This Meter is an unqualified success in Great Britain. Its simplicity of construction, and the positive character of the service performed by it, have given it pre-eminence.

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